



Broadband Access Switch™

Administration Guide



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Declarations

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Revision History

Pannaway BAS Broadband Access Switch Administration Guide

Part Number: 850-0000016-07 Rev. A

Release 07 Rev. A produced: 08/11/2006

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Under normal operating conditions for which the product was designed, Pannaway Technologies warrants that all of its Service Convergence Network hardware components shall be free of defects in material and workmanship for a period of one year (12 months) from the shipment date from Pannaway Technologies, Inc.

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- Product type
- Product serial number
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- Contact phone number
- Contact e-mail address



Chapter 1

Introduction

This guide provides administration and control information for the Pannaway Technologies Broadband Access Switch (BAS). Some or all of the features and commands in this Administration Guide are available on the Broadband Access Switch platforms supplied by Pannaway Technologies, excluding the BAS-BX.



The *BAS Administration Guide* covers the configuration and management of a BAS that has been installed and powered-up. Instructions for BAS physical installation and initialization are provided in the *Pannaway Broadband Access Switch Installation and Maintenance Guide*, the *Broadband Access Switch BAS-ADSL/DATA 48 Series Installation and Maintenance Guide*, and the *Broadband Access Switch BAS-POTS48R Installation and Maintenance Guide*.



NOTE: This manual describes the configuration commands available with Release Version 2.2.x of BAS firmware. The information contained in this manual was accurate at the time of publication; however, for the most current information, be sure that you read the release notes that accompany each release of Pannaway Technologies' BAS firmware.

1.1 Welcome

Thank you for taking the time to read the *BAS Administration Guide*. This manual contains information and procedures that will let you configure and monitor the BAS through its local management interface.

Contents of this Chapter

This chapter provides information about the manual itself, a list of the chapters and appendices, and instructions for using the manual and the Pannaway documentation set to your best advantage. This chapter also provides an introduction to the features and components of the Pannaway BAS.

This chapter contains the following sections:

Table 1-1. Contents of this Chapter

Section	On Page
"About This Manual"	1-2
"Management and Administration Overview"	1-4
"Using this Manual"	1-5
"Getting Technical Support"	1-6

1.2 About This Manual

The following information describes the *BAS Administration Guide*, the contents of its chapters, and the conventions it uses to present information.

Manual Contents

This manual contains the following chapters and appendices:

Chapter 2, "Using the BAS CLI", describes the BAS Command Line Interface, and provides instructions and guidelines for using it to configure and manage the BAS. This chapter includes an explanation of the presentation format used for all CLI commands in the BAS Administration guide.

Chapter 3, "System Configuration", details the commands used to perform basic system configuration, including the SNMP System Group commands, IP network addressing commands, IP network domain commands, and system clock/time setting commands.

Chapter 4, "Device Security", describes the commands used to secure the BAS against unauthorized access, including creating local user accounts, defining SNMP community strings, and designating authorized BAM (Broadband Access Manager) hosts for system back-up and restore operations.

Chapter 5, "Session Control", explains the commands that control the function of the BAS serial interface (console port) and the operation of telnet and terminal sessions to the BAS.

Chapter 6, "ADSL Commands", describes the commands used to view and configure ADSL parameters for the BAS, including commands for setting up ADSL alarms and line profiles, and for initializing ADSL service on a line and adjusting line quality. It also describes the various ADSL show commands that display error and performance information for the ADSL line.

Chapter 7, "Voice Configuration", details the commands used to configure the telephone functionality of the BAS's onboard DSP, including enabling the voice DSP and assigning its IP address, configuring SIP services information, and configuring lifeline and POTS telephony services. It also describes the show commands used to display voice information.

Chapter 8, "Video Client/Server Configuration", describes how to enable support for middleware-enabled services that are provided to video clients connected to the BAS.

Chapter 9, "IGMP and Multicast Commands", details the commands used to enable IGMP multicast support on the BAS, and view IGMP information.

Chapter 10, "IP Routing Table and MAC Address Table Commands", describes the commands used to configure the BAS's IP routing table and IP ARP table.

Chapter 11, “Segregating and Prioritizing Services on the BAS” details the commands that configure and manage Virtual Local Area Networks (VLANs) on the BAS.

Chapter 12, “Filtering Traffic”, describes the commands used to configure filtering rules on the BAS, and apply them to individual interfaces.

Chapter 13, “Switch Spanning Tree Configuration” describes the commands that configure and manage switch Spanning Tree Protocols (802.1d and 802.1w) on the Pannaway BAS.

Chapter 14, “Ethernet Automatic Protection Switching” describes the commands that configure and manage Ethernet Automatic Protection Switching (EAPS) on the Pannaway BAS.

Chapter 15, “Diagnostic, Test, and Maintenance Commands” explains the commands used available to provide general diagnostic and test utilities, upgrade the BAS’s operating firmware and boot RAM, save or download start-up and running configuration files, perform system logging, and run specialized debug and diagnostic tests.

Chapter 16, “Alarm and Event Monitoring” describes the commands can be used to view and manage the alarm and event monitoring subsystems supported by the BAS.

Appendix A, “List of Commands” provides an alphabetical index of CLI commands for quick reference.

Appendix B, “Example Running Config” provides an example of output from a “show running config” command, appended with comments, for one example of a typical network configuration using a BAS-ADSL42R.

The manual also provides a topical Index, Table of Contents, and applicable notices and statements of rights.

Audience

This manual is intended for use by the following audience groups:

- Network Administrators and Engineers responsible for the configuration and set-up of the Pannaway BAS.
- Networking Administration and Management personnel responsible for performing add/change operations, revising configurations, and rolling out new services or capabilities.
- Network Management personnel tasked with tracking configurations, monitoring operational statistics, and performing periodic examinations of system operation.
- Troubleshooters attempting to isolate and correct network issues that may involve the BAS.

The instructions and information in this manual assume that the Network Administrator or engineer working with the BAS is knowledgeable about signaling, routing, and the networking technologies being implemented (including SIP, IP, and IGMP/multicast routing).

BAS Identification Conventions

For the purposes of this manual, all BAS variants (BAS-ADSL32R, BAS-ADSL48R, BAS-DATA48R, BAS-POTS48R, and BAS-ADSL48SPL) are generically referred to by the term “BAS”, except in command descriptions, procedural descriptions, or other instances when identification by the specific variant model is necessary.

1.3

Management
and
Administration
Overview

Each BAS variant will not support every subset of commands provided in this user manual. For example, the entire ADSL command subset will not be available from the BAS-POTS48R command line, and the entire SIP command set will not be available from the BAS-DATA48R command line.

In each of these instances, a note at the beginning of the chapter will explicitly identify the BAS variants to which the command subset applies.

Related Documents

The *BAS Administration Guide* focuses on the configuration and management of the BAS in a functioning network, and does not provide extensive information about other Pannaway products or about physical installation and physical plant troubleshooting. Information on these topics may be found in other documents produced by Pannaway Technologies.

Other Documents

Other information about the configuration of the BAS, and the administration of the Pannaway Service Convergence Network, may be found in the following documents:

- Pannaway BAS Installation and Maintenance Guide
- Pannaway BAS-ADSL/DATA 48 Series Installation and Maintenance Guide
- Pannaway BAS-POTS48R Installation and Maintenance Guide.
- Pannaway BAS-ADSL32 Quick Installation Card
- Pannaway BAS-ADSL/DATA 48 Quick Installation Card
- Pannaway BAS-POTS48R Quick Installation Card
- Pannaway PBG Installation Guide
- Pannaway RGN Installation Guide
- Online-help for the Pannaway PBG/RGN
- Online-help for Pannaway Broadband Access Manager (BAM)

Obtaining Documents

Pannaway Technologies, Incorporated maintains its own document sets and provides copies of documents to resellers and to supported customers directly. Pannaway maintains current versions of the documentation set, and can supply versions applicable to particular product releases if required.

If you require Pannaway documentation, you may call Pannaway Technologies to request a documentation set. The documentation set can be provided in CD-ROM format, or may be downloaded from the Pannaway Technologies support and service web site.

1.3 Management and Administration Overview

The Pannaway Technologies BAS family has several variants, each of which can act as a key component of the Pannaway Service Convergence Network:

- The Pannaway BAS-ADSL32R and BAS-ADSL48R are ADSL aggregation switches that manage the converged traffic for up to 32 or 48 Pannaway Personal Branch Gateways (PBGs), Personal Branch Modems (PBMs), Residential Gateway NIDs (RGNs), or third party DSL modems. These BAS variants provide data switching, derived voice, and lifeline support to its connected devices.
- The Pannaway BAS-DATA48R is an ADSL aggregation switch that manages the converged traffic for up to 48 Pannaway Personal Branch Gateways (PBGs), Personal Branch Modems (PBMs), Residential Gateway NIDs (RGNs), or third party DSL modems. This BAS variant provides data switching only to its connected devices, without providing derived voice or lifeline support.

- The Pannaway BAS-POTS48R is a 48-port POTS only variant of the BAS. It performs VoIP aggregation serving up to 48 subscriber telephones. It also includes test access ports to allow built-in metallic test access (in both directions).
- The Pannaway BAS-ADSL48SPL combines ADSL and POTS functionality via an integrated splitter. Two RJ-21 connectors support up to 48 analog voice circuits in addition to ADSL data switching, derived voice, and lifeline support to its connected devices.

Configuring the BAS for operation in the network includes configuring system settings including basic IP information, Domain Name settings, and NTP time server settings. You can also configure the console port for local terminal connections.

Further configuration includes specifying SNMP management associations and behaviors, setting authentication parameters (including BAM authentication), and setting up user accounts and passwords.

Next, if applicable, the individual ADSL ports and line profiles are configured to set up communications with downstream DSL Customer Premises Equipment (CPE).

If the BAS is providing lifeline support to the downstream CPE, or connecting subscriber phones, you must also configure voice and SIP or MGCP/NCP settings for the BAS.

Finally, if the BAS is supporting multicast video streams, you need to enable IGMP on the BAS.

Once the BAS is operating properly, management tasks focus more closely on changing and reconfiguring existing settings in order to roll out or roll back services and capabilities. Monitoring the operation of the BAS and collecting statistics for interfaces, groups, or protocols is also important for ongoing management, and monitoring tasks are also documented in this Administration Guide.

1.4 Using this Manual

This Installation Guide provides the information and instructions needed to prepare, install, and activate a Pannaway Technologies Broadband Aggregation Switch, or BAS. To make the best use of this document, an installation or service engineer must understand the presentation and formatting of the document.

Document Conventions

Throughout this document, certain presentations of text and other items are used consistently.

Cautions

This document provides text call-outs that announce potential hazards. The call-outs are used to draw attention to important issues.



CAUTION: Cautions provide notification that an action, if taken, may damage the BAS or other equipment, cause degradation of network performance, or result in unintentional misconfiguration of the BAS.

In all cases, pay particular attention to the Caution call-outs. Other types of notifications may be found in the text, and should always be read before proceeding with a step or action.

Notes and Tips

The Note and Tip call-outs in the text supply additional information to make installation, management, and configuration of the BAS easier. These notes and tips may not apply to all conditions or implementations.

1.5

Getting Technical Support



NOTE: This format is used for Notes. Notes are used to provide additional information concerning associated steps or actions.



TIP: This format is used for Tips. Tips are used to provide advanced information which will enhance the understanding of the task in the future.

1.5 Getting Technical Support

If you experience any difficulties installing or maintaining your Pannaway Technologies products you can contact the Pannaway Technologies Technical Assistance Center (TAC) for support.

All Pannaway Technologies contracted customers have direct access to Pannaway Technologies' TAC, staffed with our experienced engineers. The TAC provides the following services:

- **Technical Assistance Center Support:** For questions regarding product functionality and services, please call 877-726-6299 (toll-free) or 603-766-5175 (long distance).
- **Emergency After Hours Support:** Available to our service contract customers 24 hours a day, 7 days a week, 365 days a year.
- **E-mail Support:** E-Mail support is provided with a guaranteed 24 hour acknowledgement. E-mail to support@pannaway.com.

For registered customers, Pannaway Technologies also provides a full self-service support portal at <http://www.pannaway.com/support/index.cfm>. Log-in using your provided registration information.

We stand ready at all times to assist you in maintaining your network.

Whenever possible, having the following information available when you report an issue will help expedite resolution time:

- Severity level of the issue
- A brief problem description
- Current firmware version
- Pertinent log files
- Serial numbers of affected hardware
- Pertinent network traces
- History of any network changes

Each issue reported to Pannaway Technologies will have an associated Service Request (SR) number assigned. Be sure to obtain your SR number to properly track your issue. For first-time service requests via web or e-mail, your SR number will be supplied to you upon our initial response.



Chapter 2

Using the BAS CLI

This chapter explains the use of the Command Line Interface and the conventions used in this document to present and describe CLI commands.

The Pannaway BAS provides a mode-based Command Line Interface that can be used for the administration and monitoring of all BAS operations. Every configurable setting in the BAS may be accessed and modified through the system CLI.

2.1 Contents of this Chapter

The information in this chapter describes the use of the system CLI to perform BAS management. The following information is presented in this chapter:

Topic	on page
Accessing CLI Management	2-2
Entering Commands	2-3
Using “no” Form Commands	2-3
Navigating Command Modes	2-4
Understanding Errors	2-5
Getting CLI System Assistance	2-6
CLI Documentation Conventions	2-7

2.2

Accessing CLI
Management

2.2 Accessing CLI Management

The Pannaway BAS CLI can be accessed with a terminal or terminal emulator either locally or remotely. The interface, presentation and options available are the same no matter which access method is used.

Local Console Interface

The BAS CLI can be accessed by a terminal or emulator connected to the front panel Console port of the BAS. This DB9 serial interface provides a direct, local connection to the system CLI. While the BAS's session characteristics can be modified through management, the default settings for a terminal or terminal emulation session are as follows:

- 9600 bps
- 8 data bits, 1 stop bit
- no parity

The initial configuration of the BAS, as described in the *Pannaway BAS Installation Guide*, must be performed through the front panel console connection. Only after the completion of the minimum field configuration can the BAS be accessed by a remote terminal session.

Instructions for connecting a terminal to the BAS console port and initiating a CLI management session are provided in the *Pannaway BAS Installation Guide*. Once connected, all management operations can be performed through the local connection as presented in this Administration Guide.



NOTE: The console cable connection should meet Telecommunications Industry Association/Electronics Industry Association standards TIA/EIA-574 (9-pin to 9-pin) or TIA/EIA-232 (9-pin to 25-pin). These standards were previously known in the industry under the generic name of recommended standard 232 (RS-232).

Remote Terminal Session

The BAS CLI responds to remote, in-band terminal sessions. These sessions connect to the BAS through existing and operating network interfaces, and can be initiated remotely by any station that knows the BAS's IP address and has a valid network connection to any of its operating interfaces.

To establish a remote terminal session, a network management station must open a Telnet or SSH connection to the BAS's IP address – either via a terminal emulation session or directly from the command line (if supported in its native OS). Once the session is established, the BAS prompts you for a username and password combination. The field configuration of the Pannaway BAS includes modifying the default system password for improved security. Contact the responsible field installation personnel to determine the password configured for the BAS.

A successful login places the remote session in the “User Exec” mode. From this mode, some BAS statistics and settings may be examined or changed. To perform more sensitive or detailed configuration, it is necessary to move through the various command modes of the BAS CLI. These modes, and the means of changing between them, are described in *Section 2.5*, “Navigating Command Modes”.

2.3 Entering Commands

All CLI commands consist of standard characters and numbers typed in a single line and submitted with the ENTER or RETURN key. Some commands are single words or short groups of words, while other commands provide for user-entered parameters that describe operation or settings.

A command in the BAS CLI always contains a base “command” field.

Commands The “command” portion of a CLI command is the identification of the command itself. This foundation of the command identifies what operation the BAS is to perform. When a command is supplied to a management session, this command portion is parsed by the CLI and compared to a table of known commands (the command tree).

Parameters A command may also require that certain values or settings be supplied. If the parameters are needed for the command to be processed by the CLI, they are considered **mandatory** parameters. If the additional parameters perform actions that are not essential to the command, or that provide additional control information, they are considered **optional** parameters.

A command parsed by the BAS CLI is examined for any mandatory parameters and optional parameters that may specify a particular use of the command, or to determine what settings to apply to the command. The CLI documentation provides indications of both mandatory and optional parameters for every command.

Values Many parameters require the submission of values. Values may be alphanumeric strings describing a configured field, numerical values representing configuration data, or a combination of the two. Some values require input that falls within a certain acceptable range. If a value is outside of the range, or provided in the wrong form, the CLI produces an error message and ignores the command. In all cases, the CLI documentation explains the type and ranges of command values.

2.4 Using “no” Form Commands

“No” is a specific form of an existing command and does not represent a new or distinct command. Only the configuration commands are available in the “no” form.

Almost every configuration command has a “no” form. In general, use the no form to reverse the action of a command or reset a value back to the default. For example, the “no ip address” configuration command restores the default system IP address of 0.0.0.0. Use the command without the keyword “no” to re-enable a disabled feature or to enable a feature that is disabled by default.

If a “no” form of a command is available, the CLI documentation specifies the accepted form of the “no” command and describes the operation of that command.

2.5

Navigating
Command
Modes

2.5 Navigating Command Modes

Configuring and administering the Pannaway BAS requires the use of the command modes of the CLI. Each mode provides control over a set of functions, interfaces, or configuration settings in the BAS.

The Mode Structure

The BAS CLI separates groups of control and monitoring commands into modes. These various modes each support specific aspects of BAS software operation. The commands available to an operator at any given point in a management session depend on the current model of the CLI session. A mode's commands are not available until the management session has entered that mode. Once a session enters a mode, the commands outside of that mode are not available to the management session.



NOTE: The “Privileged Exec” mode is an exception to this rule - in the Privileged Exec mode, all commands of the “User Exec” mode are available to the management session.

All CLI sessions begin in the “User Exec” mode. This mode provides a limited number of commands and control options. Other modes can be reached by moving through the mode hierarchy, as described in “Changing Modes” on page 2-4.

The BAS CLI provides the following command modes:

- User Exec** When the operator logs into the CLI, the User Exec mode is the initial mode. The User Exec mode contains a limited set of commands.
- Privileged Exec** To have access to the full suite of commands, the operator must enter the Privileged Exec mode. The Privileged Exec mode requires password authentication. From Privileged Exec mode, the operator can issue any Exec command or enter the Global Config mode.
- Global Config** This mode permits the operator to make modifications to the running configuration. General setup commands are grouped in this mode. From the Global Config mode, the operator can enter the Interface Config mode.
- Interface Config** Many features are enabled for a particular interface. The Interface commands enable or modify the operation of an interface.

In this mode, a physical port is set up for a specific logical connection operation. The Interface Config mode provides access to the Gigabit Ethernet and ADSL interface configuration commands.
- POTS Config** This mode allows the operator to provision a BAS port for telephony services.
- Line Config** This mode allows the operator to configure the console interface. The operator may configure the interface from the directly connected console or the virtual terminal used with Telnet.

Changing Modes

Movement between the various modes is accomplished by submitting commands. To enter the Privileged Exec mode, for example, the “enable” command is entered at a User Exec prompt. The system then asks for a password (as the Privileged Exec mode is password-secured) and changes the mode. To indicate the new mode, a series of characters is added to the BAS's name prompt. This command “prompt suffix” identifies the mode of the CLI.

Entering Modes Other mode changes require the submission of specific commands. The table that follows presents each mode by name, describes the command needed to enter that mode, and shows the prompt suffix that identifies the mode.

Command Mode	Access Method	Prompt suffix
User Exec	This is the first level of access. Perform basic tasks and list system information.	>
Privileged Exec	From the User Exec Mode, enter the enable command.	#
Global Config	From the Privileged Exec mode, enter the configure command.	(config)#
Interface Config	From the Global Config mode, enter the interface <type> <port> command.	(config-if)#
POTS Config	From the Global Config mode, enter the voice dial-peer pots <port> command. Note that the specific port number N appears in the prompt.	(pots-N)#
Line Config	From the Global Config mode, enter the lineconfig command.	(Line)#

Exiting Modes A management session may exit any CLI mode by either “backing out” to the next highest mode, or by jumping directly to the Privileged Exec mode. The following methods are used to close and exit CLI modes:

- Type the “exit” command to leave a CLI mode and back out to the previous mode. For example, entering the “exit” command when in the Interface Config mode backs the session out to the Privileged Exec mode.
- Press the CONTROL and Z keys on the terminal keyboard to send a session reset signal to the BAS. The CLI immediately exits the current CLI mode and returns the session to the Privileged Exec mode.
- Type “logout” at the Privileged Exec or User Exec mode prompt to close the terminal session and exit CLI management.

2.6 Understanding Errors

When a command is parsed by the CLI, it is compared to a tree of expected commands, parameters, and values. If the CLI encounters a portion of any command that cannot be parsed, or that violates the acceptable ranges of a field, it produces an error message.

Unexpected Input Errors

When the BAS encounters unexpected command input, it displays an “Error: Bad command” message, along with an error pointer that indicates where the parsing of the command was interrupted.

- If the required command itself is misspelled, the error pointer is a caret symbol (^) that indicates the beginning of the misspelled command.
- If a supplied parameter is misspelled, the error pointer is highlighting or underlining at the beginning of the misspelled parameter (depending on the terminal/emulator settings).

For instance, suppose the operator intends to enter the “show firmware” command, but accidentally types “**show frmware**”. The command parser displays the output message **Error: Bad command**, and highlights or underlines the start of unexpected input as depicted below.

2.6

Understanding Errors

2.7

Getting CLI
System
Assistance

```
BASR# show frmware (expected parameter is misspelled)
Error: Bad command
BASR# show frmware
```

Then, suppose the operator intends to enter the “show firmware” command, but accidentally types “**shw frmware**”. Again, the command parser displays an error message and indicates the beginning of the bad input with a caret symbol.

```
BASR# shw firmware (required command syntax is misspelled)
Error: Bad command
BASR# shw firmware
      ^
```

The user could then re-enter the command with the correct spelling, submit the command, and get the correct firmware version information for the BAS (the expected output of the command).

**Incomplete
Information Errors**

If the CLI receives a command from the management session that lacks a required field or additional specificity, the CLI displays a “missing parameter” message. This type of error message indicates only that the command requires some additional input from the user. Following the error message, the command as it was submitted is automatically entered at the current system prompt.

If, for example, an operator submitted the show interface stats adsl <port> CLI command, which displays statistics for a specified ADSL interface, but did not provide the <port> parameter, the CLI would respond as shown below:

```
BASR# show interface stats adsl
Error: Missing parameter
BASR# show interface stats adsl
```

The operator could then refer to the documentation for the command, enter an appropriate interface number, and re-submit the command.

2.7 Getting CLI System Assistance

The BAS CLI system provides means for getting additional information or command-entry assistance from the CLI itself.

**Listing Available
Commands**

All modes of the BAS CLI provide access to a list of available commands for the current mode. To display the list of commands that may be entered, type the question mark (“?”) character at the command prompt. A list of commands, in alphabetical order, is displayed.

**Auto-Completing
Command Entry**

The BAS CLI supports an auto-completion function that either:

- Supplies the remainder of a partially entered command component or parameter when you enter sufficient input for command parsing, and then press the TAB key, or
- Provides a list of possible matching input entries if one or more components or parameters match the command input provided so far.

Auto-completion works by examining the command line input to the point of entry, and then comparing that input to a table of expected input to the command.

- If the entered input only has a single match in the *expected* input, the remainder of the component or parameter is parsed when you press the TAB key and entered to completion at the command line. The following displays an example of single match entry. The {TAB} indicates that the operator pressed the TAB key at that point in the input, and the remainder of the command component was automatically completed:

```
BASR(config)# sn{TAB}mp-server
```

- If the entered input matches multiple items in the *expected* input, those multiple matches are displayed below the partially entered input, and the CLI completes the input up to the point where the command parsing branches. You can then continue adding text until an auto-completion decision can be made (or you can manually enter the remainder of the command component or parameter). The following displays an example of a multiple match entry. Again, the {TAB} indicates that the operator pressed the TAB key at that point in the input:

```
BASR(config-if)# adslprofiletable adsl{TAB}ine
adslprofiletable adslrowstatus adslmode adslmode adslmode
BASR(config-if)# adslprofiletable adsl
```

The CLI cannot perform partial command completion for operator-supplied parameters such as addresses, names, or configuration values.

**Showing Key
Bindings**

At any CLI prompt, the operator may type the “show help edit” command to show a list of the special keys that the CLI session supports. These special keys offer shortcuts for common or useful operations, such as ending terminal sessions, moving the cursor through a line of command text, or other special operations.

2.8 CLI Documentation Conventions

All commands in this Administration Guide are presented in the same fashion and follow the same basic conventions for showing their content. Each command is described following a “command heading” that identifies the components and content of the command.

The following example shows the appearance and types of information that may be provided in a command heading:

2.8

CLI
Documentation
Conventions

command name {mandatory | parameter} <mandatory value> [optional | parameter] <optional value>

The command heading begins with the command name (in this example, “command name”). This is the basic form of the command. Any text in the heading that is shown without any brackets, braces, or parenthesis around it is a mandatory part of the command, and must be typed exactly as shown, and in the same relative position to other elements in the command.

The background of the command heading is color-coded for quick visual reference.

- A deep purple background indicates the command is either a “set” or a “navigation” command.
- A dark green/gray background indicates the command is a “show” command that displays some kind of output.

If the command uses additional parameters (sometimes referred to as a command “token” or “argument”), they are enclosed in special text characters that indicate the type of parameter and its use in the command.

Angle Brackets <> Angle brackets indicate a value, usually a numerical value or a string of alphanumeric characters, that the operator must supply. An item in angle brackets must be provided to a command unless it is specifically connected to, and enclosed in the square brackets of, an optional parameter.

Curved Braces { } The use of curved braces around a value, command text, or a group of selections indicates that the items inside the braces are mandatory.

Square Brackets [] Square brackets show that the items enclosed in the brackets are optional parameters that may be used. These optional parameters provide additional detail or greater customization of a command or setting.

Selections | If the brackets or braces contain multiple items separated by the “pipe” symbol (|), those items are selections. When entering the CLI command, a value or item from the selections provided is expected.

The following page shows an example of the CLI documentation format as it is presented in the rest of the BAS Administration Guide.

command name {mandatory | parameter <value>} [optional | parameter <optional value>]

2.8

CLI Documentation Conventions

Summary The Summary presents a short description of the command, and is provided as an aid to scanning the command documentation.

Required Mode The Required Mode information lists the operational mode that must be active in order to submit the command.

User-Entered Parameters *{mandatory parameter}*
Each mandatory and optional parameter, its meaning, and any description of how it is used is presented in this section.

<value>

Any values that the command uses is also listed here, with descriptions of the units, format, and acceptable ranges of the value.

Description The Description field presents a more detailed explanation of the command. If any additional information is useful for understanding the command, the effects of the command, or calculating values that should be used, that information is presented here.

“no” Form no command name

If a “no” form of the command is available, it is presented here. The description following the “no” command explains the effects of the “no” command.

Defaults The Default section identifies the default condition or settings of the command. If the mandatory parameters, optional parameters, or values have default states in the BAS, those items are presented here. Similarly, if a command activates or deactivates a particular function in the BAS, the default state of that function is identified.

Example This portion of the command documentation shows an example of the command as it would be entered in a CLI session. If the command returns formatted output or statistics, an example of that is shown beneath the command.

```
BASR# command name parameter 255
```

Command Output The Command Output section is used to detail the output of commands that provide statistics or system configuration information. This section lists the items shown on screen and explains the importance or meaning of the information. If the information requires additional description, a table may be provided.

Screen Item	Meaning, representation, or description.
Screen Item	Field explanation or description.
Display Text	Information about the displayed text.

Related Commands If a command has any other commands directly associated with it, those associated commands are listed here, with a reference to the chapter and page number where the command is described.

2.8

*CLI
Documentation
Conventions*



Chapter 3

System Configuration

This chapter details the commands used to perform basic system configuration, including the IP network addressing commands, IP network domain commands, SNMP System Group commands, DHCP Relay commands, and system clock/time setting commands. It also details how to display Fast and Gigabit Ethernet port information, and configure auto-negotiation for the Gigabit Ethernet ports.

3.1 Contents of this Chapter

This chapter details the commands used to configure the basic system-level settings for the Pannaway BAS. The following topics are discussed in this chapter:

Topic	on page
IP Addressing Commands	3-1
IP Domain Commands	3-5
DHCP Relay Commands	3-7
SNMP System Group Commands	3-18
System Clock Setting and Display Commands	3-21
Fast Ethernet and Gigabit Ethernet Information	3-24
System Performance Monitoring Commands	3-28

3.2 IP Addressing Commands

The following commands are used to configure the BAS IP address, subnet mask, and default gateway information for IP connectivity to data and management networks.



NOTE: Refer to “Voice IP Networking Commands” on page 7-8 for information on configuring the voice network.

```
ip address data {<ip-address> <subnet mask> | dhcp}
```

3.2

IP Addressing Commands

Summary Sets the IP network addressing information for the BAS with respect to its gigabit Ethernet (data) network. The IP address can be assigned statically or dynamically.

Required Mode Global Config

User-Entered Parameters If a static IP address is to be assigned, the following are mandatory values to be supplied:

<ip-address>

The IP address in dotted-decimal notation (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 254).

<subnet mask>

The subnet mask, in dotted-decimal format (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 255).

If a dynamic IP address is to be assigned:

dhcp

Indicates the IP address is to be retrieved from a DHCP server.

Description This command sets the IP addressing information, including the BAS's IP address and subnet mask, for operation on the data network. An IP address is the number that uniquely identifies the BAS as an IP host on the internet, so that packets can be routed to the correct destination. The subnet mask is used by an IP host to determine whether other IP hosts are on its own subnetwork, or must be reached through a gateway.

The IP address can be manually assigned (a "static" IP address), or it can be retrieved dynamically from a DHCP server.

- If you manually assign an IP address, you must specify the IP address and subnet mask values. You must also specify a default gateway. See "ip default-gateway {<ip-address>}" on page 3-4.
- If you specify DHCP, the BAS should retrieve its IP address, subnet mask, and default gateway information over the network automatically. If the BAS can't contact a DHCP server over the network, an error message is displayed and no network address is assigned. At this point, you must either specify a static IP address, or re-perform the command using the DHCP argument until a DHCP address is successfully retrieved.

"no" Form no ip address data
Restores the default IP address and subnet mask values.

Defaults 0.0.0.0 for both IP address and subnet mask.

Example

```
BASR(config)# ip address mgmt 192.168.15.4 255.255.255.0
```

Related Commands show ip address data on page 3-4
ip default-gateway {<ip-address>} on page 3-4
ip name-server {<ip-address>} [<ip-address 2>] on page 3-6

```
ip address mgmt {<ip-address> <subnet mask> | dhcp}
```

Summary Sets the IP network addressing information for the BAS's 10/100 service port, which can be used to connect the BAS to a separate management network. The IP address can be assigned statically or dynamically.



CAUTION: The service port should not be used except under the supervision of Pannaway Technologies' Technical Assistance Center.

Required Mode Global Config

User-Entered Parameters If a static IP address is to be assigned, the following are mandatory values to be supplied:

<ip-address>

The IP address in dotted-decimal notation (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 254).

<subnet mask>

The subnet mask, in dotted-decimal format (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 255).

If a dynamic IP address is to be assigned:

dhcp

Indicates the IP address is to be retrieved from a DHCP server.

Description This command sets the IP network addressing information for the BAS's 10/100 Ethernet service port, including the IP address and subnet mask. This port can be used to connect a separate management network. The IP address can be manually assigned or it can be retrieved dynamically from a DHCP server.

- If you manually assign an IP address, you must specify the IP address and subnet mask values. The management network information does not currently support a default gateway.
- If you specify DHCP, the BAS should retrieve its management network IP address, subnet mask, and default gateway information over the network automatically. If the BAS can't contact a DHCP server over the network, an error message is displayed and no network address is assigned. At this point, you must either specify a static IP address, or re-perform the command using the DHCP argument until a DHCP address is successfully retrieved.



NOTE: The BAS does not currently retrieve its DNS information via DHCP, and this must be manually assigned. See "ip name-server {<ip-address>} [<ip-address 2>]" on page 3-6 for more information.

"no" Form no ip address mgmt
Restores the default IP address and subnet mask values for the 10/100 port.

Defaults 0.0.0.0 for both IP address and subnet mask.

3.2

IP Addressing Commands

3.2

IP Addressing
Commands**Example**

```
BASR(config)# ip address mgmt 192.168.15.4 255.255.255.0
```

Related Commands show ip address mgmt on page 3-5
 ip default-gateway {<ip-address>} on page 3-4
 ip name-server {<ip-address>} [<ip-address 2>] on page 3-6

```
ip default-gateway {<ip-address>}
```

Summary Sets the default gateway IP address for the BAS's data network.

Required Mode Global Config

User-Entered Parameters <ip-address>

The IP address of the default gateway for the BAS's data network, in dotted-decimal format (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 254).

Description This command configures the default gateway for the BAS's data network. A default gateway is the router – or gateway – device that forwards IP packets to destination hosts on a different network or subnetwork than the transmitting host.



NOTE: You must use the show ip route command to display the data network default gateway.

“no” Form no ip address default-gateway {<ip-address>
 Removes the previously specified default gateway value, restoring the default gateway to its default null (0.0.0.0) value.

Defaults 0.0.0.0

Example

```
BASR(config)# ip default-gateway 192.168.15.1
```

Related Commands ip address mgmt {<ip-address> <subnet mask> | dhcp} on page 3-3
 show ip route on page 10-2

```
show ip address data
```

Summary Displays the IP address information assigned to the BAS for data network operation.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User-Entered Parameters None

Description This command displays the IP address and subnet mask information assigned to the BAS's data network.

Example

```
BASR(config)# show ip address data

IP address: 10.1.2.7
Subnet Mask: 255.255.255.0
```

Command Output The following output is provided:

- IP Address – The IP address of the BAS with respect to gigabit Ethernet operation.
- Subnet Mask – The IP subnet mask for the BAS with respect to gigabit Ethernet operation.

Related Commands ip address data {<ip-address> <subnet mask> | dhcp} on page 3-2

show ip address mgmt

Summary Displays the IP address information assigned to the BAS's 10/100 Ethernet port for management network operation.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User-Entered Parameters None

Description This command displays the IP address and subnet mask information assigned to the BAS's 10/100BASE-T management network port.

Example

```
BASR(config)# show ip address mgmt

IP address: 10.1.6.100
Subnet Mask: 255.255.255.0
```

Command Output The following output is provided:

- IP Address – The IP address of the BAS's management network port.
- Subnet Mask – The IP subnet mask for the BAS's management network port.

Related Commands ip address mgmt {<ip-address> <subnet mask> | dhcp} on page 3-3

3.3 IP Domain Commands

The following commands are used to set up the local domain information for the network on which the BAS is installed.

ip domain-name {<domain-name>}

Summary Specifies a domain name that is used to identify hosts on the BAS's local network (either the data network or management network).

Required Mode Global Config

3.3

IP Domain Commands

3.3

IP Domain
Commands**User Entered Parameters** **<domain-name>**

The easily remembered identifier or “alias” for the BAS’s local network, when a Domain Name System is in place.

Description This command provides the BAS with knowledge of its local domain. A domain is used by an individual, organization, or commercial or government entity to identify its IP hosts with Internet addresses by easily remembered aliases rather than IP addresses. By providing a local domain, the operator does not have to enter IP addresses or fully-qualified domain names when specifying IP hosts in commands. For example, rather than entering “ping 172.16.4.95” or “ping bas512.acme.com”, the operator could simply enter “ping bas512.”

“no” form no ip domain-name {<domain-name>
Removes the previously specified domain name.

Defaults None

Example

```
BASR(config)# ip domain-name acme.com
```

Related Commands ip name-server {<ip-address>} [<ip-address 2>] on page 3-6
show hosts on page 3-7

ip name-server {<ip-address>} [<ip-address 2>]

Summary Specifies the Domain Name System (DNS) server(s) used on the BAS’s local network (management network or data network).

Required Mode Global Config

User Entered Parameters **<ip-address>**

A valid network IP address of a local domain name server.

<ip-address2>

A valid network IP address of an optional, secondary DNS server.

Description This command specifies a DNS server used on the BAS’s local network. More than one DNS server can be specified.

“no” form no ip name-server {<ip-address>
Deletes the DNS server specified by the given IP address.

Defaults None

Example

```
BASR(config)# ip name-server 172.16.1.5
```

Related Commands ip domain-name {<domain-name>} on page 3-5
show hosts on page 3-7

show hosts

Summary Displays DNS information for the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Displays the DNS information for the BAS, including its default (local) domain information and any configured name server IP addresses.

Example

```
BASR(config)# show hosts
Default domain is pannaway.com
Name servers are 172.16.1.5 172.16.1.6
```

Command Output The following output is provided:

- Default domain is ... – The local domain specified by the “ip domain-name” command.
- Name servers are ... – Any name server IP addresses configured via the “ip name-server” command.

Related Commands ip domain-name {<domain-name>} on page 3-5
ip name-server {<ip-address>} [<ip-address 2>] on page 3-6

3.4

DHCP Relay
Commands

3.4 DHCP Relay Commands



NOTE: The following commands do not apply to the BAS-POTS48R variant.

Dynamic Host Configuration Protocol, or DHCP, allows network managers to centralize and automate the process of assigning IP addresses to hosts on the network. DHCP acts in a client-server relationship, with the server assigning IP addresses from a pool (and any optional configuration parameters, such as network server addresses) to requesting clients (such as Pannaway PBGs or PBMs).

The DHCP request issued by a client is a broadcast packet (with a UDP destination port value of 67) to which the DHCP server will respond if it has configuration information for that client, or discard if it does not. A broadcast packet must be examined by every device on the same subnetwork as the broadcasting client, and by every device on each subnetwork that the packet is forwarded across.

On a network comprised of numerous subnets, a DHCP server can often reside on a different subnet than the broadcasting DHCP client. In this configuration, an intermediary device called a DHCP/BootP Relay Agent is used to streamline the DHCP process, reduce network traffic, and provide added security to the network.

The BootP/ DHCP Relay Agent agent acts a proxy on behalf of the broadcasting DHCP client. The Relay Agent is provisioned with the IP address(es) of the DHCP Server(s) on the network. It can optionally be provisioned information about DHCP

3.4

DHCP Relay Commands

clients on its attached subnetwork, including the MAC addresses of the clients and the IP address of each client's DHCP server.

When the BootP/DHCP Relay Agent receives a broadcast DHCP Request from a booting client, it issues a proxy DHCP Request as a unicast packet directed to the appropriate DHCP server – thus reducing network traffic by preventing the propagation of broadcast packets.

If an optional client list is configured, the Relay Agent adds network security and further reduces unnecessary traffic by discarding any DHCP Requests from unknown DHCP clients.

When the BootP/DHCP Relay Agent receives a unicast DHCP Reply from the DHCP server, the Agent proxies the reply back to the client, providing it with the information for it to boot onto the network.

For the purpose of correctly directing the DHCP Reply back to its DHCP client destination, the BAS implements the DHCP Relay Information Agent option (DHCP option 82, as described in RFC 3046). This option conveys information known locally to the Relay Agent, including a Circuit ID (the port on which the Request was received) and a Remote ID (a trusted identifier of the remote client, in this case the VPI/VCI associated with the circuit and its VLAN tag), as well as the BAS IP address itself.

The BAS inserts this Relay Information Agent option into DHCP requests that it relays. Servers that recognize this Relay Agent Information option may use the information to implement specific IP address or other parameter assignment policies (although this is not the current intent of Pannaway's implementation). The DHCP Server returns the option information verbatim to the relay agent in its server-to-client replies, and the relay agent strips the option before forwarding the reply to the client.

DHCP Relay Configuration Commands

Use the following commands to implement DHCP Relay operation for the BAS.

```
dhcpr enable
```

Summary Activates the BootP/DHCP Relay Agent.

Required Mode Global Config

**User Entered
Parameters** None

Description Use this command to activate the BootP/DHCP Agent on the BAS, so that it relays BootP/DHCP Request packets by proxy.



CAUTION: If the BootP/DHCP Agent is enabled, but no DHCP server or client information is specified, the BAS does not operate as a DHCP relay. It simply inserts the DHCP option 82 information in the DHCP request packet, and transmits it as a broadcast packet out of both gigabit Ethernet ports.

“no” form no dhcpr enable
The “no” form of the command disables BootP/DHCP Relay on the BAS.

Defaults Mode disabled

Example

```
BASR48_2(config)# dhcpr enable
```

Related Commands dhcpr server {<server name> <server ip-address>} on page 3-9
 dhcpr client {<client name> <client mac-address> <server name | all>} on page 3-9
 dhcpr vlan {<vlan name> <vlanid> <server name | all>} on page 3-10
 dhcpr max-hop-count {<1-16>} on page 3-11
 dhcpr min-wait-time {<0-65535>} on page 3-12
 dhcpr drop-unknown-clients on page 3-12
 show dhcpr on page 3-13

3.4**DHCP Relay
Commands**

```
dhcpr server {<server name> <server ip-address>}
```

Summary Defines a DHCP server entry to which requests can be relayed.

Required Mode Global Config

User Entered**Parameters**

<server name>
 The server host name (up to 50 characters). This name is included in the BootP/DHCP relay packet sent by the BAS.

<server ip-address>

The server IP address, in dotted quad notation. This is the server IP address; it will be included in BootP Replies issued by that server.

Description Use this command to identify one or more DHCP servers to which the BAS will relay DHCP/BootP requests on behalf of its connected client hosts. You can assign up to eight DHCP servers.

“no” form no dhcpr server {<server name> <server ip-address>}

The no form of this command deletes the specified DHCP server from the list of available DHCP server entries.

Defaults None

Example

```
BASR48_2(config)# dhcpr server DHCP_1 172.16.1.38
```

Related Commands dhcpr enable on page 3-8
 dhcpr client {<client name> <client mac-address> <server name | all>} on page 3-9
 dhcpr vlan {<vlan name> <vlanid> <server name | all>} on page 3-10
 dhcpr drop-unknown-clients on page 3-12
 show dhcpr on page 3-13

```
dhcpr client {<client name> <client mac-address> <server name | all>}
```

Summary Defines a known DHCP client from which DHCP requests are authorized for relay.

Required Mode Global Config

3.4

DHCP Relay Commands

User Entered *<client name>*
Parameters

The client host name (up to 50 characters). This name is strictly used for local reference with respect to the BAS.

<client mac-address>

The client's hardware address, in 6-byte hexadecimal format (xx:xx:xx:xx:xx:xx, where x can be 0-9, A-F). This client address is included in the DHCP/BootP request.

<server name | all>

If set to a specific "server name", BootP/DHCP Requests from this client are only relayed to the specified server. The supplied server name must match that of one defined via a "dhcp server" configuration command; if it does not, an error is returned.

If set to "all", BootP/DHCP Requests from this client are relayed to all specified servers. If no servers are configured, an error is returned.

Description

Use this command to create a list of known/authorized DHCP clients for which the BAS will relay DHCP/BootP Requests and Replies. Up to 240 client entries can be created.

When used in conjunction with the "dhcpr drop-unknown-clients" command, the BAS will only relay DHCP/BootP Requests for client entries in this list

"no" form

no dhcpr {<client name> <client mac-address> <server name | all>}

The "no" form of this command deletes the specified client from the known DHCP clients list.

Defaults

None

Example

```
BASR48_2(config)# dhcpr client SMIST_PBG 00:0a:9f:12:34:56 DHCP_2
```

Related Commands

dhcpr enable on page 3-8

dhcpr server {<server name> <server ip-address>} on page 3-9

dhcpr vlan {<vlan name> <vlanid> <server name | all>} on page 3-10

dhcpr drop-unknown-clients on page 3-12

show dhcpr on page 3-13

show dhcpr clients on page 3-15

dhcpr vlan {<vlan name> <vlanid> <server name | all>}

Summary

Defines a known VLAN from which DHCP/BootP Requests are authorized for relay.

Required Mode

Global Config

User Entered
<vlan name>
Parameters

The VLAN name (up to 50 characters). This name is strictly used for local reference with respect to the BAS. Note that when you are actually creating VLANs, a VLAN is only identified by its VLAN ID, not by name.

<vlanid>

The identifier of a previously created VLAN that you want to use for authorizing DHCP/BootP Requests. See *Chapter 11, "Segregating and Prioritizing Services on the BAS"* for more information. The supplied VLAN ID must match that of a previously created VLAN; if it does not, an error is returned.

<server name / all>

If set to a specific “server name”, BootP/DHCP Requests with this VLAN tag are only relayed to the specified server. The supplied server name must match that of one defined via a “dhcp server” configuration command; if it does not, an error is returned.

If set to “all”, BootP/DHCP Requests with this VLAN tag are relayed to all specified servers. If no servers are configured, an error is returned.

Description Use this command to create a list of known/authorized VLANs for which the BAS will relay DHCP/BootP Requests and Replies. Up to six VLAN filtering entries can be created.

When used in conjunction with the “dhcpr drop-unknown-clients” command, the BAS will only relay DHCP/BootP Requests that are tagged with a VLAN ID on this list.

“no” form no dhcpr vlan {<vlan name> <vlanid> <server name | all>}

Defaults None

Example

```
BASR48_2(config)# dhcpr vlan data_vlan 4060 all
```

Related Commands dhcpr enable on page 3-8
 dhcpr server {<server name> <server ip-address>} on page 3-9
 dhcpr client {<client name> <client mac-address> <server name | all>} on page 3-9
 dhcpr drop-unknown-clients on page 3-12
 configure vlan {<vlanid>} on page 11-4
 show dhcpr on page 3-13
 show dhcpr vlans on page 3-16

dhcpr max-hop-count {<1-16>}

Summary Defines the maximum allowable hops for the BAS to relay an incoming DHCP/BootP Request.

Required Mode Global Config

User Entered **<1-16>**

Parameters The hop count threshold which the BAS uses to determine whether to relay a DHCP/BootP Request.

Description Use this parameter to define the hop count threshold that the BAS uses to determine whether to relay a DHCP/BootP request. According to RFC1542, a DHCP/BootP Relay agent must discard any incoming Request packet that has a hop count greater than 16. This maximum hop count value can be lowered.

“no” form no dhcpr max-hop-count
 The “no” form of this command sets the hop count threshold back to its default value of 4 hops.

Defaults Not set (the default hop-count threshold is four).

3.4

DHCP Relay
Commands**Example**

```
BASR48_2(config)# dhcpr max-hop-count 8
```

Related Commands dhcpr enable on page 3-8
show dhcpr on page 3-13

```
dhcpr min-wait-time {<0-65535>}
```

Summary Defines the minimum value of the “secs” field in an incoming DHCP/BootP Request before the BAS will relay the Request.

Required Mode Global Config

User Entered Parameters

<0-65535>

The minimum value of the “secs” field in the incoming DHCP/BootP Request (in seconds).

Description A DHCP/BootP Request message contains a “secs” field that *should* represent the elapsed time, in seconds, since the client sent its first request message. Note that this implies that the ‘secs’ field of the first Request message from that client *should* be set to zero. By setting this parameter, the BAS uses the value of the ‘secs’ (seconds since client began booting) field of the request as a factor in deciding whether to relay the request.

“no” form no dhcpr min-wait-time

The “no” form of this command sets the BAS to accept the default minimum value of 0 seconds (that is, the first client request).

Defaults 0

Example

```
BASR48_2(config)# dhcpr min-wait-time 10
```

Related Commands dhcpr enable on page 3-8
show dhcpr on page 3-13

```
dhcpr drop-unknown-clients
```

Summary Forces the BAS to discard DHCP/BootP packets that are issued by or destined to any unknown client MAC address and/or unknown VLANs.

Required Mode Global Config

User Entered Parameters None

Description Entering this command causes the BAS to silently discard any DHCP/BootP Requests and Replies that are issued by, or destined to, an unknown client MAC address (that is, one that is not in the “clients” list) or that have an unknown VLAN tag (that is, one that is not in the “VLANs” list).



CAUTION: If both a trusted client list *and* a trusted VLAN list are configured, the DHCP/BootP Request must pass both the client and VLAN requirements for the BAS to relay the message. If a request comes in from a known client, but with an unknown/unspecified VLAN tag (or vice versa), the BAS discards the request.

“no” form no dhcpr drop-unknown-clients
Using the “no” form of this command causes the BAS to revert to relaying DHCP/BootP messages from any client MAC address.

Defaults Mode disabled

Example

```
BASR48_2(config)# dhcpr drop-unknown-clients
```

Related Commands dhcpr enable on page 3-8
dhcpr server {<server name> <server ip-address>} on page 3-9
dhcpr client {<client name> <client mac-address> <server name | all>} on page 3-9
dhcpr vlan {<vlan name> <vlanid> <server name | all>} on page 3-10
show dhcpr on page 3-13

DHCP Relay Show Commands

Use the following commands to display DHCP Relay information.

```
show dhcpr
```

Summary Show DHCP/BootP Relay settings for the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description When this command is entered, the BAS displays DHCP and BootP Relay configuration information.

Example

```
BASR# show dhcpr
```

```
DCHP Relay Agent Current Configuration
```

```
-----
Relay State :                ENABLED
Drop Unknown Client DHCP Packets State :  DISABLED
Max Hop Count :              4
Min Wait Time :              0
Number of DHCP Servers configured :      2 of 8
Number of DHCP Client Mappings :         17 of 240

Number of VLAN Mappings :          2 of 6
```

3.4

DHCP Relay Commands

3.4

DHCP Relay
Commands

Command Output

Relay State	Indicates whether DHCP Relay is enabled or disabled.
Drop Unknown Client DHCP Packets State	Indicates whether the BAS is configured to drop unknown DHCP/BootP packets (Enabled) or allow them (Disabled)
Max Hop Count	The maximum hop count threshold set for relaying DHCP/BootP Request packets.
Min Wait Time	The minimum seconds threshold set for relaying DHCP/BootP Request packets.
Number of DHCP Servers configured	The total number of defined DHCP servers (out of eight available).
Number of DHCP Client Mappings	The total number of DHCP client entries defined (out of 240 available).
Number of VLAN Mappings	The total number of VLAN entries defined (out of six available).

Related Commands `dhcpr enable` on page 3-8
`dhcpr server {<server name> <server ip-address>}` on page 3-9
`dhcpr client {<client name> <client mac-address> <server name | all>}` on page 3-9
`dhcpr vlan {<vlan name> <vlanid> <server name | all>}` on page 3-10
`dhcpr max-hop-count {<1-16>}` on page 3-11
`dhcpr min-wait-time {<0-65535>}` on page 3-12

Summary Show DHCP/BootP Relay settings for the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description When this command is entered, the BAS displays DHCP and BootP Relay configuration information.

Example

```
BASR# show dhcpr
```

```
DCHP Relay Agent Current Configuration
```

```
-----
```

```
Relay State :                ENABLED
Drop Unknown Client DHCP Packets State :  DISABLED
Max Hop Count :                4
Min Wait Time :                0
Number of DHCP Servers configured :    2 of 8
Number of DHCP Client Mappings :    17 of 240

Number of VLAN Mappings :                2 of 6
```

Command Output

Relay State	Indicates whether DHCP Relay is enabled or disabled.
Drop Unknown Client DHCP Packets State	Indicates whether the BAS is configured to drop unknown DHCP/BootP packets (Enabled) or allow them (Disabled)

3.4

DHCP Relay
Commands

Max Hop Count	The maximum hop count threshold set for relaying DHCP/BootP Request packets.
Min Wait Time	The minimum seconds threshold set for relaying DHCP/BootP Request packets.
Number of DHCP Servers configured	The total number of defined DHCP servers (out of eight available).
Number of DHCP Client Mappings	The total number of DHCP client entries defined (out of 240 available).
Number of VLAN Mappings	The total number of VLAN entries defined (out of six available).

Related Commands `dhcpr enable` on page 3-8
`dhcpr server {<server name> <server ip-address>}` on page 3-9
`dhcpr client {<client name> <client mac-address> <server name | all>}` on page 3-9
`dhcpr vlan {<vlan name> <vlanid> <server name | all>}` on page 3-10
`dhcpr max-hop-count {<1-16>}` on page 3-11
`dhcpr min-wait-time {<0-65535>}` on page 3-12

show dhcpr clients

Summary Show the authorized DHCP/BootP Relay client list.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Entering this command displays the list of DHCP/BootP Clients configured for DHCP/BootP Relay via this BAS, along with any DHCP Server mapping.

Example

```
BASR(config)# show dhcpr clients

DHCP Relay Agent - DHCP Client to Server Mappings
-----
PBG_3 - 00:0a:9f:12:34:56
hobbes - 172.16.99.99 - 00:0a:9f:50:08:2a
```

Command Output

Client Name	The name assigned to this client by the "dhcpr client" command.
Client MAC Address	The hardware address associated with this client by the "dhcpr client" command.
Assigned Servers	If a specific server has been assigned, the name, IP address, and MAC address of that server. If all servers are assigned, this displays "All Configured Servers".

Related Commands `dhcpr enable` on page 3-8
`dhcpr server {<server name> <server ip-address>}` on page 3-9
`dhcpr client {<client name> <client mac-address> <server name | all>}` on page 3-9

3.4

DHCP Relay
Commands

show dhcp servers

Summary Show the configured DHCP servers.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Entering this command displays the list of DHCP Servers to which the BAS will relay DHCP/BootP messages.

Example

```
BASR(config)# show dhcp servers
```

```
DCHP Relay Agent - DHCP Servers
```

```
-----
```

```
hobbes - 172.16.99.99 - 00:0a:9f:50:08:2a
```

Command Output

Server Information	The name, IP address, and MAC address of a server to which the BAS relays DHCP packets.
--------------------	---

Related Commands dhcp enable on page 3-8
dhcp server {<server name> <server ip-address>} on page 3-9

show dhcp vlans

Summary Show the authorized VLAN list.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Entering this command displays the list of VLANs configured for DHCP/BootP Relay via this BAS, along with any associated DHCP server mapping.

Example

```
BASR(config)# show dhcp vlans
```

```
DCHP Relay Agent - VLAN to Server Mappings
```

```
-----
```

```
mgmt_vlan - 4062
```

```
hobbes - 172.16.99.99 - 00:0a:9f:50:08:2a
```

3.4

DHCP Relay
Commands

Command Output

VLAN Information	The name assigned to this client by the "dhcpr vlan" command, along with the VLAN ID of the VLAN.
Assigned Servers	If a specific server has been assigned, the name, IP address, and MAC address of that server. If all servers are assigned, this displays "All Configured Servers".

Related Commands dhcpr enable on page 3-8
dhcpr server {<server name> <server ip-address>} on page 3-9
dhcpr vlan {<vlan name> <vlanid> <server name | all>} on page 3-10

show dhcpr statistics

Summary Displays DHCP/BootP Relay statistics.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Entering this command displays statistical information for BAS DHCP/BootP Relay operation.

Example

```
BASR(config)# show dhcpr statistics
```

DHCP Relay Agent Statistics

```
-----
```

```
Number of DHCP Request Messages Received      = 1762
Number of DHCP Reply Messages Received         = 1754
Number of DHCP Request Messages Forwarded      = 1758
Number of DHCP Reply Messages Forwarded        = 1754
Number of DHCP Messages Discarded              = 8
Number of DHCP Messages From Unknowns         = 7
```

Command Output

Number of DHCP Request Messages Received	The total number of DHCP Requests received by the BAS.
Number of DHCP Reply Messages Received	The total number of DHCP Replies received by the BAS.
Number of DHCP Request Messages Forwarded	The total number of DHCP Requests forwarded by the BAS DHCP/BootP Relay agent (transmitted by booting clients).
Number of DHCP Reply Messages Forwarded	The total number of DHCP Replies forwarded by the BAS DHCP/BootP Relay agent (transmitted by DHCP servers).
Number of DHCP Messages Discarded	The total number of DHCP messages discarded during the relay process, due to Client/VLAN filtering, incorrectly/ illegally formatted DHCP/BootP packets, excessive hop count, or other reasons.
Number of DHCP Messages From Unknowns	The number of DHCP messages received from an unknown/ unauthorized DHCP client (or with an unknown VLAN tag).

Related Commands dhcpr enable on page 3-8

3.5

SNMP System
Group
Commands

3.5 SNMP System Group Commands

Use the following commands to set and display the SNMP System Group information for the BAS. The SNMP MIB-II System Group settings provide information that is used by a network or element management system (such as Pannaway's Broadband Access Manager) to identify an IP network device within its community.

```
snmp-server contact {<contact name>}
```

Summary Sets the system contact information for the BAS.

Required Mode Global Config

User Entered *<contact name>*

Parameters

An identifier of the person/organization responsible for maintaining the BAS. The range is from 1 to 31 alphanumeric characters, including spaces (see the note below).



NOTE: You must surround the descriptive string in quotation marks (" ") to use spaces in entry. If you enter a space in the text string without using surrounding quotes, you get a bad command error.

Description

This command sets the SNMP MIB-II System Contact value. This is generally used to identify the party responsible for BAS system maintenance. The identification method can be arbitrary – for example, a name, organization, or a phone/beeper/pager number are equally valid. This information is usually displayed in a remote SNMP management platform, such as BAM.

"no" form

no snmp-server contact

The "no" form of the command sets the system contact back to its default value.

Defaults

Pannaway Technologies

Example

```
BASR(config)# snmp-server contact "Fred Jones x543"
```

Related Commands show sysinfo on page 3-20

```
snmp-server location {<location name>}
```

Summary Sets the system location information for the BAS.

Required Mode Global Config

User Entered *<location name>*

Parameters

An identifier of the physical location of the BAS. The range is from 1 to 31 alphanumeric characters, including spaces (see the note below).



NOTE: You must surround the descriptive string in quotation marks (" ") to use spaces in entry. If you enter a space in the text string without using surrounding quotes, you get a bad command error.

Description This command sets the SNMP MIB-II System Location value. This is generally used to identify the physical location of the BAS itself. The location identification can be arbitrary – for example, a Central Office, a wiring closet, or a rack number. This information is usually displayed in a remote SNMP management platform, such as BAM.



TIP: BAM uses the System Location for the Map It feature, that launches Google maps and passes the System Location value as the mapping parameter (for example, Long Hill Road, Dover, NH).

“no” form no snmp-server location
The “no” form of the command sets the system contact back to its default value.

Defaults Planet Earth

Example

```
BASR(config)# snmp-server location Portsmouth_CO
```

Related Commands show sysinfo on page 3-20

snmp-server name {<system name>}

Summary Sets the system name information for the BAS.

Required Mode Global Config

User Entered Parameters *<system name>*
A descriptive string that identifies the BAS. The range is from 1 to 31 alphanumeric characters, including spaces (see the note below).



NOTE: You must surround the descriptive string in quotation marks (“ ”) to use spaces in entry. If you enter a space in the text string without using surrounding quotes, you get a bad command error.

Description This command sets the SNMP MIB-II System Name value. This is generally used to uniquely describe the BAS for identification purposes. The system name might indicate some location identifier, or might provide some unique index. The naming convention is arbitrary – based upon practices established by the telco/service provider. This information is usually displayed in a remote SNMP management platform, such as BAM.

“no” form no snmp-server name
The “no” form of the command sets the system name back to its default value.

Defaults Pannaway BAS

Example

```
BASR(config)# snmp-server name BAS_Rk2_Sh1
```

Related Commands show sysinfo on page 3-20

show sysinfo

3.5

SNMP System
Group
Commands

Summary Displays SNMP MIB-II System Group information.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays SNMP MIB-II System Group information, including information configured through management, system uptime, and read-only Pannaway-specific system information that is pre-set in device firmware.

Example

```
BASR(config)# show sysinfo
```

```
System Description: Pannaway BAS 1.1.7 Mar 26 2004, 15:46:58 builder.pannaway.com
System Name: BAS-000
System Location: Planet Earth
System Contact: Pannaway Technologies
System Object ID: 1.3.6.1.4.1.14198.2
System Uptime: 0 days 2 hrs 27 mins 47 secs
```

Command Output The command output includes the following information:

System Description	(read-only) A brief textual description of the system, including operating firmware and build-specifics.
System Name	The MIB-II sysName of the device, used for network management (as set via "snmp-server sysname").
System Location	The MIB-II sysLocation of the device, used for network management (as set via "snmp-server location").
System Contact	The MIB-II sysContact of the device, used for network management. (as set via "snmp-server contact").
System Object ID	(read-only) Pannaway Technologies authoritative identification of the network management subsystem contained in the BAS (1.3.6.1.4.1.14198.2 under Pannaway's node of the SMI enterprises subtree).
System Uptime	The time since this system was last re-initialized, in days, hours, minutes, seconds format.

Related Commands snmp-server contact {<contact name>} on page 3-18
snmp-server location {<location name>} on page 3-18
snmp-server name {<system name>} on page 3-19

3.6 System Clock Setting and Display Commands

The following commands allow you to set and view the system clock at the BAS. The time can be set manually, or can be set automatically via the Network Time Protocol (NTP).

Manual System Clock Setting

Use the following command to set the BAS's system clock manually.

```
clock set {<yyyy:mm:dd:hh:mm:[ss]>}
```

Summary Manually sets the system's real time clock.

Required Mode Privileged Exec

User-Entered Parameters <yyyy:mm:dd:hh:mm>

The date and time to be set at the system clock, where the colon-separated date and time elements are as listed below. Leading zeroes are not required.

- yyyy – sets the four-digit year; a one or two-digit entry (y or yy) will be correctly set to the four-digit value (that is, entering 4 or 04 is equivalent to 2004)
- mm – sets the month, where mm is a value from 1 to 12
- dd – sets the date, where dd is a value from 1 to 31
- hh – sets the hours in 24-hour format, where hh is a value from 1 (1 AM) to 24 (12 midnight).
- mm – sets the minutes, where mm is a value from 0 to 59.

ss/

The setting for seconds, where ss is a value from 00 to 60. If omitted, ss defaults to 00 when the command is entered.

Description Set the system's real time clock, in 4-digit year, month, date, and 24-hour clock time, with an optional seconds setting. If the seconds setting is omitted, seconds are automatically set to 00 on command entry. The weekday is calculated automatically and displayed when you perform a "show clock" command.

Defaults 0 for seconds (if not set); no other defaults.

Example

```
BASR# clock set 2004:1:21:4:13:56
```

Related Commands ntp server {<ntp ip-address | hostname>} on page 3-22
show clock on page 3-24

3.6

System Clock Setting and Display Commands

3.6

System Clock
Setting and
Display
Commands**Automatic System
Clock Setting**

Use the following command to set the BAS's system time automatically via an NTP Server.

```
ntp server {<ntp ip-address | hostname>}
```

Summary Automatically sets the system's real time clock via an NTP server.

Required Mode Global Config

User-Entered Parameters *<ntp ip-address / hostname>*

The identity of a Network Time Protocol (NTP) server that can be accessed over the Internet. The server can be identified via its IP address (in dotted-decimal format), or via its Internet hostname if a DNS server has been configured for the BAS.

Description Set the system's real time clock using a known NTP server. NTP is a protocol built on top of TCP/IP that assures accurate local timekeeping with reference to radio, atomic or other clocks located on the Internet. Once the clock is set, the BAS – acting as the NTP Client – will re-synchronize its clock with the server at some interval between 64 and 1024 seconds.



NOTE: When the BAS is set to NTP, it displays its system clock in Greenwich Mean Time (GMT)/ Coordinated Universal Time (UCT) unless the timezone setting is also configured.

"no" Form `no ntp server <ntp ip-address>`

Stops the NTP client function of the BAS. The BAS's built-in system clock will remain set to the last known NTP time setting.

Defaults None.

Example

```
BASR(config)# ntp server time.nist.gov
```

Related Commands `ip name-server {<ip-address>} [<ip-address 2>]` on page 3-6
`clock set {<yyyy:mm:dd:hh:mm:[ss]>}` on page 3-21
`clock timezone {<atlantic | eastern | central | mountain | pacific | alaska | hawaii | samoan>}` on page 3-23
`show clock` on page 3-24

Timezone and Daylight Savings

The following commands apply to the system clock setting, whether it is manually set or retrieved via NTP:

clock timezone {<atlantic | eastern | central | mountain | pacific | alaska | hawaii | samoan>}

Summary Sets the system's time zone, based upon official United States time.

Required Mode Privileged Exec

User-Entered Parameters <atlantic / eastern / central / mountain / pacific / alaska / hawaii / samoan>
The US time zone to be set at the BAS.

Description Set the system's time zone setting. Any clock setting of UCT (coordinated universal time or GMT) retrieved via an NTP server is converted to the local time zone setting. Note also that the clock time zone must be set before enabling daylight savings via the "clock daylight-savings enable" command described below.

Defaults No time zone set.

Example

```
BASR# clock timezone eastern
```

Related Commands ntp server {<ntp ip-address | hostname>} on page 3-22
clock daylight-savings enable on page 3-23
show clock on page 3-24

clock daylight-savings enable

Summary Activates daylight savings time for the system clock.

Required Mode Privileged Exec

User-Entered Parameters None

Description Set the system clock to automatically adjust itself for daylight savings, based on the current system clock setting. Note also that the clock time zone must be set before enabling daylight savings via the "clock timezone" command described above.

Defaults Daylight savings time disabled.

"no" Form no clock daylight-savings enable
Restores the default setting of daylight savings mode disabled.

Example

```
BASR# clock daylight-savings enable
```

Related Commands ntp server {<ntp ip-address | hostname>} on page 3-22
clock timezone {<atlantic | eastern | central | mountain | pacific | alaska | hawaii | samoan>} on page 3-23
show clock on page 3-24

3.6

System Clock Setting and Display Commands

3.7

Fast Ethernet
and Gigabit
Ethernet
Information**Displaying the System Clock**

Use the following command to view the BAS's system clock setting.

```
show clock
```

Summary Displays the system's real time clock setting.

Required Mode Privileged Exec

User-Entered Parameters None

Description Displays the system's real time clock setting, as administratively set or updated via the specified NTP server. It also displays the clock time zone setting and configured daylight savings setting.



NOTE: When the BAS is set to NTP, it displays its system clock in Greenwich Mean Time (GMT)/Universal Coordinated Time (CUT) unless a time zone is set.

Example

```
BASR# show clock

Local time: MON DEC 13 13:37:23 2004
Timezone: Eastern Standard Time
DST rule: United States daylight-savings time
DST will start Apr 4
```

Command Output The system clock setting in Day, Month, Date, MM:HH:SS Year format

Related Commands

- clock set {<yyyy:mm:dd:hh:mm:[ss]>} on page 3-21
- ntp server {<ntp ip-address | hostname>} on page 3-22
- clock timezone {<atlantic | eastern | central | mountain | pacific | alaska | hawaii | samoan>} on page 3-23
- clock daylight-savings enable on page 3-23

3.7 Fast Ethernet and Gigabit Ethernet Information

The following commands are used to configure the Gigabit Ethernet interfaces, and display statistical information for the Fast Ethernet and Gigabit Ethernet interfaces.

```
configure interface gigabit-ethernet {<port>} auto-negotiation {enable | disable}
```

Summary Configures the Gigabit Ethernet port for auto-negotiation or for fixed transmission speed and duplex mode.



NOTE: The Gigabit Ethernet ports only support 1000 Mbps/full-duplex transmission. This command determines whether the device at the far end can be set to auto-negotiate, or must be specifically configured for 1000 Mbps/full-duplex operation.

Required Mode Interface Config

3.7

Fast Ethernet
and Gigabit
Ethernet
Information

User-Entered Parameters **<port>**
The Gigabit Ethernet port to configure for auto-negotiation.

<enable / disable>
Enables or disables auto-negotiation for the specified port.

Description This command enables or disables auto-negotiation for a specified Gigabit Ethernet port. If enabled, the interface auto-negotiates with the connected Ethernet device to 1000 Mbps/full-duplex operation. If auto-negotiation is disabled, the interface is set to 1000 Mbps/full-duplex, and the far end device must be configured for the same setting.

Defaults Auto-negotiation enabled.

Example

```
BASR(config)# interface gigabit-ethernet 1 auto-negotiation enable
```

Related Commands show interface gigabit-ethernet {<port>} auto-negotiation on page 3-25

```
clear stats gigabit-ethernet {<port>}
```

Summary Resets Gigabit Ethernet statistics.

Required Mode Privileged Exec

User Entered Parameters **<port>**
The Gigabit Ethernet port for which to clear statistics.

Description Resets Gigabit Ethernet statistics counters to zero. These statistics can be displayed via the “show interface stats gig-ethernet” command.

“no” form None

Defaults None

Example

```
BASR# clear stats gigabit-ethernet 1
```

Related Commands show interface stats {fast-ethernet | gig-ethernet} on page 3-26

```
show interface gigabit-ethernet {<port>} auto-negotiation
```

Summary Displays a Gigabit Ethernet port’s auto-negotiation setting.

Required Mode Privileged Exec

User-Entered Parameters **<port>**
The Gigabit Ethernet port for which to display auto-negotiation settings

Description Displays the specified Gigabit Ethernet port’s auto-negotiation setting: Enabled or Disabled.

3.7

Fast Ethernet
and Gigabit
Ethernet
Information**Example**

```
BASR# show interface gigabit-ethernet 1 auto-negotiation
Gig port 1 auto-negotiation is enabled.
```

Related Commands configure interface gigabit-ethernet {<port>} auto-negotiation {enable | disable} on page 3-24

```
show interface stats {fast-ethernet | gig-ethernet}
```

Summary Shows interface statistics and operational status for the specified interface type (Fast Ethernet or Gigabit Ethernet).

Required Mode Privileged Exec

User Entered Parameters *{fast-ethernet | gig-ethernet}*
The interface type for which to display statistics.

Description This command displays standard SNMP MIB-II interface statistics and information for the Fast Ethernet (Management) or Gigabit Ethernet ports. All statistics are provided by 32-bit counters, are counted from 0 since the system was last initialized or since counters were last reset, and roll over at 4,294,967,295.

Example

```
BASR# show interface stats fast-ethernet
IP MTU                : 1522
Bits per Second       : 100000000
Admin state           : Up
Oper state             : Up
in unicast packets    : 8745
in broadcast packets  : 0
in multicast packets  : 2559
out unicast packets   : 20681
out broadcast packets : 5
out multicast packets : 0
```

3.7

Fast Ethernet
and Gigabit
Ethernet
Information

```
BASR# show interface stats gig-ethernet
```

```
Gigabit Ethernet 1:
```

```
Egress Tagging      : Disabled
IP MTU              : 1522
Shared BW bps       : 1000000000
Admin state         : Up
Oper state          : Down
in unicast packets  : 0
in broadcast packets : 0
in multicast packets : 0
out unicast packets : 0
out broadcast packets : 0
out multicast packets : 0
```

```
Gigabit Ethernet 2:
```

```
Egress Tagging      : Disabled
IP MTU              : 1522
Shared BW bps       : 1000000000
Admin state         : Up
Oper state          : Down
in unicast packets  : 0
in broadcast packets : 0
in multicast packets : 0
out unicast packets : 0
out broadcast packets : 0
out multicast packets : 0
```

Command Output The following information is displayed only for the Gigabit Ethernet ports:

Egress Tagging	Indicates whether egress tagging (VLAN tagging) is enabled or disabled for the interface. See configure interface gigabit-ethernet {<port>} egress-tagging [<vlanid>] on page 11-6 for more information.
Shared BW bps	The Gigabit Ethernet port's nominal bandwidth: 1,000,000,000 bps.

The following information is displayed only for the front-panel Fast Ethernet port (if provisioned as a management port).

Bits per Second	The Fast Ethernet port's nominal bandwidth: 100,000,000 for Fast Ethernet operation or 10,000,000 for Ethernet operation.
-----------------	---

The following information is displayed for both Fast Ethernet and Gigabit Ethernet ports:

IP MTU	The IP Maximum Transmission Unit, or the size of the largest packet that can be sent or received on the interface. This is 1522 bytes for Gigabit, Fast Ethernet, and 10 Mbps Ethernet.
Admin state	The current administrative state of the interface: up (operational), down (not initialized, or administratively disabled), or test (in some test state; no operational packets can be passed).

3.8

System
Performance
Monitoring
Commands

Oper state	The current operational state of the interface: <i>up</i> if the interface is ready to receive and transmit network traffic; <i>down</i> if the interface is not initialized or is administratively disabled; <i>testing</i> if it is in a test state and no operational packets can be passed; <i>unknown</i> if the interface status can't be determined for some reason; or <i>notPresent</i> if the interface is missing components (typically hardware).
in unicast packets	Number of packets received by the interface that were not addressed to a multicast or broadcast address.
in broadcast packets	Number of packets received by the interface that were addressed to a broadcast address.
in multicast packets	Number of packets received by the interface that were addressed to a multicast address. For a MAC-layer protocol, this includes both Group and Functional multicast addresses.
out unicast packets	Number of packets transmitted by the interface that were not addressed to a multicast or broadcast address.
out broadcast packets	Number of packets requested for transmission by this interface that were addressed to a broadcast address, including those that were discarded or not sent.
out multicast packets	Number of packets requested for transmission by this interface that were addressed to a multicast address, including those that were discarded or not sent. For a MAC-layer protocol, this includes both Group and Functional multicast addresses.

Related Commands configure interface gigabit-ethernet {<port>} egress-tagging [<vlanid>] on page 11-6

3.8 System Performance Monitoring Commands

The following commands can be used to monitor receive and transmit throughput and on the BAS ADSL and gigabit Ethernet ports.



NOTE: The BAS-POTS48R device does not support ADSL ports.

```
show throughput {adsl | gigabit-ethernet} {<port>}
```

Summary Shows throughput statistics for a selected ADSL or gigabit Ethernet port.

Required Mode Privileged Exec

User Entered Parameters <port>

The interface index of the ADSL or gigabit Ethernet port for which to display statistics.

Description This command displays transmit and receive throughput statistics for a selected ADSL or gigabit Ethernet port, as calculated over the previous one second and five second intervals. It also displays the maximum transmit and receive rate for the selected port since the BAS was last initialized.

Example

```
BASR# show throughput adsl 1
```

```

+-----+
| Current Throughputs |
+-----+

Port_Info  Tx_Thput  Rx_Thput  Tx_5Sec  Rx_5sec  Max_Tx  Max_Rx
-----
ADSL  1      5.79M    2.3K     5.67M    2.1K    13.41M  28.5K

```

```
BASR# show throughput gigabit-ethernet 1
```

```

+-----+
| Current Throughputs |
+-----+

Port_Info  Tx_Thput  Rx_Thput  Tx_5Sec  Rx_5sec  Max_Tx  Max_Rx
-----
GIGE  1      4.3K    12.19M    3.7K    12.24M   29.1K   20.26M

```

Command Output The following information is displayed only for the selected port:

Port Info	The port type (ADSL or GIGE) and interface index N.
Tx Thput	The port's transmit throughput (in Megabytes or Kilobytes) over the last one second interval. <ul style="list-style-type: none"> For a gigabit Ethernet port, this is traffic transmitted downstream to all ADSL ports. For an ADSL port, this is traffic transmitted downstream to the ADSL CPE and/or other CPE.
Rx Thput	The port's receive throughput (in Megabytes or Kilobytes) over the last one second interval. <ul style="list-style-type: none"> For a gigabit Ethernet port, this is traffic received from all ADSL ports. For an ADSL port, this is traffic received from the ADSL CPE and/or other CPE.
Tx 5Sec	The port's transmit throughput (in Megabytes or Kilobytes) over the last five second interval.
Rx 5Sec	The port's receive throughput (in Megabytes or Kilobytes) over the last five second interval.
Max Tx	The port's maximum transmit rate since the BAS was last initialized.
Max Rx	The port's maximum receive rate since the BAS was last initialized.

Related Commands show throughput all on page 3-29

```
show throughput all
```

Summary Shows throughput statistics for all data ports on the BAS (ADSL and gigabit Ethernet).

Required Mode Privileged Exec

User Entered Parameters None

3.8

System Performance Monitoring Commands

3.8

System
Performance
Monitoring
Commands

Description This command displays transmit and receive throughput statistics for all ADSL and gigabit Ethernet ports on the BAS, as calculated over the previous one second and five second intervals. It also displays the maximum transmit and receive rate for all ports since the BAS was last initialized, as well as the cumulative transmit and receive rates for all ADSL ports over the last five second interval.

Example

```
BASR# show throughput all
```

+-----+ Current Throughputs +-----+						
Port_Info	Tx_Thput	Rx_Thput	Tx_5Sec	Rx_5sec	Max_Tx	Max_Rx
GIGE [01]	1.2K	12.44M	7.2K	12.34M	27.10K	20.26M
GIGE [02]	0	0	0	0	0	0
ADSL [01]	5.80M	1.5K	5.82M	1.8K	13.41M	28.5K
ADSL [02]	0	0	0	0	0	0
ADSL [03]	0	0	0	0	0	0
ADSL [04]	0	0	0	0	0	0
ADSL [05]	0	0	0	0	0	0
ADSL [06]	0	0	0	0	0	0
ADSL [07]	0	0	0	0	0	0
ADSL [08]	0	0	0	0	0	0
ADSL [09]	0	0	0	0	0	0
ADSL [10]	0	0	0	0	0	0
ADSL [11]	0	0	0	0	0	0
ADSL [12]	0	0	0	0	0	0
ADSL [13]	0	0	0	0	0	0
ADSL [14]	0	0	0	0	0	0
ADSL [15]	0	0	0	0	0	0
ADSL [16]	0	0	0	0	0	0
ADSL [17]	0	0	0	0	0	0
ADSL [18]	0	0	0	0	0	0
ADSL [19]	0	0	0	0	0	0
ADSL [20]	0	0	0	0	0	0
ADSL [21]	0	0	0	0	0	0
ADSL [22]	0	0	0	0	0	0
ADSL [23]	0	0	0	0	0	0
ADSL [24]	0	0	0	0	0	0
ADSL [25]	0	0	0	0	0	0
ADSL [26]	0	0	0	0	0	0
ADSL [27]	0	0	0	0	0	0
ADSL [28]	0	0	0	0	0	0
ADSL [29]	0	0	0	0	0	0
ADSL [30]	0	0	0	0	0	0
ADSL [31]	0	0	0	0	0	0
ADSL [32]	0	0	0	0	0	0

Total ADSL Tx Throughput: 5.82M

Total ADSL Rx Throughput: 1.8K

Command Output The following information is displayed only for all ports:

Port Info	The port type (ADSL or GIGE) and interface index N.
Tx Thput	The port's transmit throughput (in Megabytes or Kilobytes) over the last one second interval. <ul style="list-style-type: none"> For a gigabit Ethernet port, this is traffic transmitted downstream to all ADSL ports. For an ADSL port, this is traffic transmitted downstream to the ADSL CPE and/or other CPE.
Rx Thput	The port's receive throughput (in Megabytes or Kilobytes) over the last one second interval. <ul style="list-style-type: none"> For a gigabit Ethernet port, this is traffic received from all ADSL ports. For an ADSL port, this is traffic received from the ADSL CPE and/or other CPE.
Tx 5Sec	The port's transmit throughput (in Megabytes or Kilobytes) over the last five second interval.
Rx 5Sec	The port's receive throughput (in Megabytes or Kilobytes) over the last five second interval.
Max Tx	The port's maximum transmit rate since the BAS was last initialized.
Max Rx	The port's maximum receive rate since the BAS was last initialized.
Total ADSL Tx Throughput	The cumulative transmit throughput for all ADSL ports on the BAS (as measured over the last five second interval).
Total ADSL Rx Throughput	The cumulative receive throughput for all ADSL ports on the BAS (as measured over the last five second interval).

Related Commands configure interface gigabit-ethernet {<port>} egress-tagging [<vlanid>] on page 11-6

```
show utilization adsl {<port>}
```

Summary Shows utilization statistics for a selected ADSL port.

Required Mode Privileged Exec

User Entered Parameters <port>

The interface index of the ADSL or gigabit Ethernet port for which to display statistics.

Description This command displays the bandwidth utilization for the current port, organized by traffic type (data, voice, video, and broadcast) and service domain.

Example

```
BASR# show utilization adsl 1
```

```

+-----+
| TX Port Utilization Breakdown |
| (Port 01)                      |
+-----+
Flow      SD0    SD1    SD2    SD3    SD4    SD5
-----
Data Util  0%    0%    0%    0%    0%    0%
Voice Util  0%    0%    0%    0%    0%    0%
Video Util  0%    0%    54%   0%    0%    0%
MC Util     0%    0%    0%    0%    0%    0%
\         \         \         \         \         /
\         |         |         |         |         /
+-----+-----+-----+-----+-----+
|
Current TX Utilization      54%
TX Train Rate               24.54M
Current RX Utilization      0%
RX Train Rate               1.09M

```

Command Output The following information is displayed only for the selected port:

Flow SD N	The service domain (1-6) associated with the traffic.
Data Util	The percentage of total bandwidth consumed by data traffic on each service domain. Data traffic is defined as any traffic besides voice or multicast video traffic.
Voice Util	The percentage of total bandwidth consumed by voice traffic on each service domain.
Video Util	The percentage of total bandwidth consumed by multicast video traffic on each service domain.
Bcast Util	The percentage of total bandwidth consumed by broadcast traffic on each service domain.
Current TX Utilization	The percentage of available bandwidth in the transmit (BAS to CPE) direction consumed by all traffic types on all service domains. Available transmit bandwidth is determined by the Tx Train Rate (below).
Tx Train Rate	The transmit bandwidth attained after ADSL training.
Current RX Utilization	The percentage of total available receive (CPE to BAS) bandwidth consumed by all traffic types on all service domains. Available receive bandwidth is determined by the Rx Train Rate (below).
Rx Train Rate	The receive bandwidth attained after ADSL training.

Related Commands show throughput all on page 3-29

3.8

System
Performance
Monitoring
Commands

show throughput all

Summary Shows throughput statistics for all data ports on the BAS (ADSL and gigabit Ethernet).

Required Mode Privileged Exec

User Entered Parameters None

Description This command displays transmit and receive throughput statistics for all ADSL and gigabit Ethernet ports on the BAS, as calculated over the previous one second and five second intervals. It also displays the maximum transmit and receive rate for all ports since the BAS was last initialized, as well as the cumulative transmit and receive rates for all ADSL ports over the last five second interval

Example

```
BASR# show utilization all
```

```
+-----+
| Current Utilization |
+-----+
```

Port_Info	Cur_Tx_Spd	Tx_Util	Cur_Rx_Spd	Rx_Util
GIGE 1	1000.00M	0%	1000.00M	1%
GIGE 2	0	0%	0	0%
ADSL 1	24.54M	53%	1.09M	0%
ADSL 2	0	0%	0	0%
ADSL 3	0	0%	0	0%
ADSL 4	0	0%	0	0%
ADSL 5	0	0%	0	0%
ADSL 6	0	0%	0	0%
ADSL 7	0	0%	0	0%
ADSL 8	0	0%	0	0%
ADSL 9	0	0%	0	0%
ADSL 10	0	0%	0	0%
ADSL 11	0	0%	0	0%
ADSL 12	0	0%	0	0%
ADSL 13	0	0%	0	0%
ADSL 14	0	0%	0	0%
ADSL 15	0	0%	0	0%
ADSL 16	0	0%	0	0%
ADSL 17	0	0%	0	0%
ADSL 18	0	0%	0	0%
ADSL 19	0	0%	0	0%
ADSL 20	0	0%	0	0%
ADSL 21	0	0%	0	0%
ADSL 22	0	0%	0	0%
ADSL 23	0	0%	0	0%
ADSL 24	0	0%	0	0%
ADSL 25	0	0%	0	0%
ADSL 26	0	0%	0	0%
ADSL 27	0	0%	0	0%
ADSL 28	0	0%	0	0%
ADSL 29	0	0%	0	0%
ADSL 30	0	0%	0	0%
ADSL 31	0	0%	0	0%
ADSL 32	0	0%	0	0%

3.8

System Performance Monitoring Commands

3.8

System
Performance
Monitoring
Commands

Command Output The following information is displayed only for all ports:

Port Info	The port type (ADSL or GIGE) and interface index N.
Tx Thput	The port's transmit throughput (in Megabytes or Kilobytes) over the last one second interval. <ul style="list-style-type: none"> For a gigabit Ethernet port, this is traffic transmitted downstream to all ADSL ports. For an ADSL port, this is traffic transmitted downstream to the ADSL CPE and/or other CPE.
Rx Thput	The port's receive throughput (in Megabytes or Kilobytes) over the last one second interval. <ul style="list-style-type: none"> For a gigabit Ethernet port, this is traffic received from all ADSL ports. For an ADSL port, this is traffic received from the ADSL CPE and/or other CPE.
Tx 5Sec	The port's transmit throughput (in Megabytes or Kilobytes) over the last five second interval.
Rx 5Sec	The port's receive throughput (in Megabytes or Kilobytes) over the last five second interval.
Max Tx	The port's maximum transmit rate since the BAS was last initialized.
Max Rx	The port's maximum receive rate since the BAS was last initialized.
Total ADSL Tx Throughput	The cumulative transmit throughput for all ADSL ports on the BAS (as measured over the last five second interval).
Total ADSL Rx Throughput	The cumulative receive throughput for all ADSL ports on the BAS (as measured over the last five second interval).

Related Commands configure interface gigabit-ethernet {<port>} egress-tagging [<vlanid>] on page 11-6

Chapter 4

Device Security



This chapter details the commands used to secure the BAS against unauthorized access, including creating local user accounts, defining SNMP community strings, locking ports to MAC or IP addresses, and designating authorized BAM (Broadband Access Manager) hosts for system back-up and restore operations.

4.1 Contents of this Chapter

This chapter details the commands used to prevent unauthorized access to the Pannaway BAS. The following topics are discussed in this chapter:

Topic	on page
User Account Configuration Commands	4-1
SNMP Community Configuration Commands	4-4
MAC Address, OUI, and IP Address Locking Commands	4-6
Broadband Access Manager Host Configuration Commands	4-26
Session Security Configuration	4-27

4.2 User Account Configuration Commands

User account commands allow you to configure authorized user accounts for accessing the BAS through local management.

users name {<username>}

Summary Adds a new user account name for local management, and associate a password.

Required Mode Global Config

User Entered <username>

Parameters An account user name comprised of alphanumeric characters, up to 32 characters long. The user name is case-sensitive.

<password>

An associated user password, between 8 and 16 alphanumeric characters.

4.2

User Account
Configuration
Commands

Description This command adds a new user account name.

After you enter a user name, you are automatically prompted to enter a user password (minimum of eight characters; maximum of 16 characters).

If you enter a carriage return, it is considered a blank password and you are warned with a message stating “Warning: Password disabled”. Re-enter the carriage return if you want a blank password.



NOTE: For security, the password is not displayed as you enter it.

The system provides a single default user name: *Admin*, with the associated password *pannaway*.



NOTE: The default Admin account can't be deleted, although its password can be changed.

“no” form no users name {<username>}

The “no” form of this command deletes a previously defined user account name.

Defaults Username = *Admin*; password = *pannaway*.

Example

```
BASR(config)# users name FIELDTECH
New password:
Confirm:
```

```
BASR(config)# users name Frank
New password:
Warning: Password disabled
Confirm:
```

Related Commands users passwd {<username> | enable} on page 4-2
show users info on page 4-3

```
users passwd {<username> | enable}
```

Summary Associates a password with either a user account or with the Privileged Exec mode.

Required Mode Global Config

User Entered Parameters <username>

An existing user name with which to associate the new password.

<enable>

Associates the new password with the Privileged Exec mode.

<password>

The new password, between 8 and 16 characters, to be associated with the user name or Privileged Exec mode.

4.2

User Account
Configuration
Commands

Description This command associates a password with either a user account, or with the Privileged Exec mode, depending on the argument passed to the command line. The minimum password length is eight characters; the maximum is 16 characters. User passwords can be comprised of alphanumeric characters and symbols – for example dash (-), underscore (_), question mark (?), asterisk (*), ampersand (&) and so forth. Passwords are case-sensitive.

- If you enter <username> as the argument, you must enter a valid user name as defined by the “users name” command. After entering the user name, you are automatically prompted to enter a user password.
- If you enter “enable” as the argument, you are automatically prompted to enter a password that must be used to enter Privileged Exec mode via the enable command.



NOTE: If you enter a carriage return in either instance, it is considered a blank password and you are warned accordingly.



NOTE: When you are changing an existing password, you are not prompted to enter the old password.

Defaults *pannaway* for both the Admin user account and for the Privileged Exec mode.

Example

```
BASR(config)# users passwd Frank
New password:
Confirm:
```

```
BASR(config)# users passwd enable
New password:
Confirm:
```

Related Commands enable on page 5-7
users name {<username>} on page 4-1

show users info

Summary Displays all currently configured user accounts for the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Displays the user names for all currently configured user accounts for the BAS.

4.3

SNMP
Community
Configuration
Commands

Example

```
BASR(config)# show users info
Users
-----
Admin
john
paul
ringo
george
```

Command Output A list of valid user account names for the BAS.

Related Commands users name {<username>} on page 4-1

4.3 SNMP Community Configuration Commands

These commands define the SNMP communities that have access to the BAS, determine whether these communities have read or write privileges, enable or disable SNMP access for a given community, and display the current SNMP community settings.

```
snmp-server community name {read-write | read-only} {<comm_name>}
```

Summary Configures a read-only or read-write SNMP community for the BAS.

Required Mode Global Config

User Entered Parameters {*read-write* / *read-only*}

Determines the level of access associated with the defined community.

- read-write indicates SNMP management stations in this community can both retrieve device information performing SNMP Get operations, and configure the device via SNMP Set operations.
- read-only indicates SNMP management stations in this community can only perform SNMP Get operations to the BAS to retrieve device information.

<comm_name>

The SNMP community name to assign, up to 16 characters. The community name is case-sensitive.

Description This command adds (and names) the two SNMP communities supported by the BAS. A community name is a name associated with the BAS and with a set of SNMP managers that manage it with a specified privileged level (read-write or read-only). The BAS has a default community name of *private* for its read-write community, and *public* for its read-only community.



NOTE: The BAS supports a single read-write community and a single read-only community. If a community name already exists, it is overwritten by any new community name specified for its same access-level.

“no” form no snmp-server community name {read-write | read-only}

This command restores the default community name to the read-write or read-only SNMP community.

Defaults *private* for the read-write community; *public* for the read-only community.

Example

```
BASR(config)# snmp-server community name read-write net_admin
```

Related Commands snmp-server community mode {read-write | read-only} on page 4-5
show snmpcommunity on page 4-5

snmp-server community mode {read-write | read-only}

Summary Enables SNMP operations for the given access level.

Required Mode Global Config

User Entered Parameters {read-write / read-only}

Determines the level of access to be enabled.

- read-write indicates both SNMP Get and Set operations are enabled for SNMP managers of the BAS.
- read-only indicates only SNMP Get operations are enabled for SNMP managers of the BAS.

Description This command enables SNMP Get or Set operations, depending on the specified access level.

“no” form no snmp-server community mode {read-write | read-only}
The “no” form of this command disables SNMP operations for the given access level. For example, if read-write access is disabled, SNMP management stations could not perform any SNMP set commands.

Defaults Enabled for both read-write and read-only access.

Example

```
BASR(config)# snmp-server community mode read-write
BASR(config)# no snmp-server community mode read-only
```

Related Commands snmp-server community name {read-write | read-only} {<comm_name>} on page 4-4
show snmpcommunity on page 4-5

show snmpcommunity

Summary Displays the current SNMP community settings at the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Displays all SNMP communities configured for the BAS, the associated access-level, and the current status of the community mode setting.

4.3

SNMP Community Configuration Commands

Example

```
BASR(config)# show snmpcommunity
```

SNMP Community Name	Access Mode	Status
public	Read Only	Disabled
net_admin	Read/Write	Enabled

Command Output This command displays the following output:

SNMP Community Name	The defined SNMP community name.
Access Mode	The access-level (Read Only or Read/Write) associated with the SNMP community.
Status	Indicates whether SNMP operations are enabled or disabled for the associated SNMP community.

Related Commands `snmp-server community name {read-write | read-only} {<comm_name>}` on page 4-4
`snmp-server community mode {read-write | read-only}` on page 4-5

4.4 MAC Address, OUI, and IP Address Locking Commands

The BAS can be configured to perform MAC address, OUI (Organizational Unique Identifier), or IP address locking on its supported virtual interfaces (ADSL port/service domain combinations). These features ensure that only the specified source MAC, OUI, or IP address(es) have access to a port/service-domain. Once the locking feature is applied, the BAS discards packets from any other source MAC, OUI, or IP address that attempts to communicate through the port/service domain.



NOTE: For information on service domains, see *Chapter 11, “Segregating and Prioritizing Services on the BAS”*.

Locking is applied on a per ADSL port/service domain combination. A single port/service domain supports *either* source/destination IP address locking or OUI/MAC address locking; both types of locking cannot be enabled on the same port/service domain simultaneously. If you attempt to create a OUI or MAC lock entry on a port/service domain that has already been configured for IP locking (or vice versa), you receive an error message.

Note that for either OUI/MAC or IP address locking to take effect, the associated feature has to be enabled at a global level. Individual port/service domains can be configured for either OUI/MAC address locking or IP address locking; however, locking will not take effect unless it has been enabled at the global level.

MAC Address Locking

There are three ways in which MAC address locking can be configured:

- Static MAC locking entries can be administratively defined. Up to eight static entries can be defined per ADSL port/service domain combination.
- A single MAC locking entry can be dynamically learned, based on the next source MAC address learned on the ADSL port/service domain. Any other learned MAC addresses on the port are ignored.
- Up to eight MAC locking entries can be dynamically learned, based on the existing learned MAC addresses on the ADSL port/service domain.

4.4

MAC Address, OUI, and IP Address Locking Commands

Use the following commands to configure, clear, and view MAC locking.

mac-lock enable

Summary Enable or disable MAC locking on the BAS.

Required Mode Global Config

User Entered Parameters None

Description This command globally enables MAC locking across the BAS. This is the default state of the device.

“no” form no mac-lock enable

The “no” form of this command disables MAC locking across the BAS; however, any existing MAC lock configurations are preserved, and MAC locking configuration commands can still be performed (although they are not enforced until MAC locking is globally enabled).



NOTE: This is an operational difference from BAS release 2.0, in which disabling MAC locking deleted all existing MAC locking configurations and prevented MAC locking commands from being performed.



TIP: A MAC lock entry is only displayed via the “show mac-lock” command if there is a MAC address associated with the entry. The MAC address can either be statically assigned, or learned *after* a device is detected on the port (that is, the port has been set to dynamically learn one or more addresses, MAC locking has been enabled, and a device has actually communicated through the locked port).

If MAC locking has been disabled and you decide to re-enable it, you may want to perform a “show running-config” command to check for any unexpected “mac-lock first” entries. These entries will take effect when locking is enabled, even though they are not displayed via a “show mac-lock” command.

Defaults MAC locking enabled

Example

```
BASR# configure mac-lock enable
```

Related Commands configure interface adsl {<port>} service-domain {<1-6>} mac-lock {<source mac>} on page 4-7
configure mac-lock first {<port-range> <domain-range>} on page 4-8
show mac-lock {<port-range> <domain-range> | all} on page 4-12

configure interface adsl {<port>} service-domain {<1-6>} mac-lock {<source mac>}

Summary Configure a static MAC locking entry on an ADSL port and service domain.

Required Mode Interface Config

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MAC Address,
OUI, and IP
Address Locking
Commands

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MAC Address,
OUI, and IP
Address Locking
Commands**User Entered
Parameters**

<port>
The ADSL port (1-48) on which you want to configure a MAC locking entry.

<1-6>
The selected service domain (virtual channel), indexed 1–6.

<source mac>
The source MAC address that you want to administratively lock to the port and service domain combination.

Description This command statically enters a source MAC address that you want locked to the specified ADSL port and service domain. You can create up to eight static MAC lock entries per ADSL port and service domain.

“no” form no configure interface adsl {<port>} service-domain {<1-6>} mac-lock {<source mac>}
The “no” form of this command deletes the MAC locking entry specified by ADSL port index, service domain index, and source MAC address.

Defaults None

Example

```
BASR# configure interface adsl 1 service-domain 1 mac-lock 00:12:34:ab:cd:bb
```

Related Commands mac-lock enable on page 4-7
clear mac-lock {<port-range> <domain-range> | all} on page 4-11
show mac-lock {<port-range> <domain-range> | all} on page 4-12
show locking {<port-range> <domain-range> | all} on page 4-24

configure mac-lock first {<port-range> <domain-range>}

Summary Lock an ADSL port(s) and service domain(s) to the next new MAC address dynamically detected on the virtual interface.



NOTE: This is an operational difference from BAS release 2.0. In BAS 2.0, the mac-lock-first command locked to the oldest (that is, earliest detected) entry in the source MAC address table. In BAS 2.2, the virtual interface is locked to the next new MAC address that is detected (that is, from an incoming data packet with a previously undetected source MAC address).

If you want to run this command to lock on a previously detected address that is already in the virtual interface's source address table, you must first run the mac-locking first command and then clear the source MAC address table so that it does not have any entries. In this way, an incoming data packet will be detected as having a new source MAC address, and the virtual interface will be locked upon reception.

Required Mode Global Config

**User Entered
Parameters**

<port-range>
The range of ports for which you want to configure dynamic MAC locking, where the start and end port in the range can be any port index from 1–48 (depending on the BAS variant).

Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) to be configured for dynamic MAC locking, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

Description This command configures MAC locking on a range of ADSL ports and service domains to the next MAC address that is detected in the BAS's learned source address table for each virtual interface. If there is no MAC address yet detected on a virtual interface, the locking occurs when the first MAC address is detected on that interface.



NOTE: If you specify a dynamic MAC locking command with a range that includes a port/service domain that already has static MAC locking configured, any learned addresses detected on the virtual interface are also added to the locked MAC address list.

Defaults None

Example

```
BASR# configure mac-lock 3-4 1-2 4 first
```

Related Commands mac-lock enable on page 4-7
clear mac-lock {<port-range> <domain-range> | all} on page 4-11
configure interface adsl {<port>} service-domain {<1-6>} mac-lock first on page 4-9
configure mac-lock learning {<port-range> <domain-range>} [1-8] on page 4-10

```
configure interface adsl {<port>} service-domain {<1-6>} mac-lock first
```

Summary Configure an individual ADSL interface and service domain to lock to the next new MAC address dynamically detected on the virtual interface.

Required Mode Interface Config

User Entered Parameters **<port>**

The ADSL port (1-48) on which you want to configure a MAC lock first entry.

<1-6>

The selected service domain (virtual channel), indexed 1–6.

Description This command configures a single ADSL port and service domain to lock to the next MAC address that is detected in the BAS's learned source address table that virtual interface. If there is no MAC address yet detected on the virtual interface, the locking occurs when the first MAC address is detected.

“no” form no configure interface adsl {<port>} service-domain {<1-6>} mac-lock first
The “no” form of this command clears the MAC lock first entry specified by ADSL port index and service domain index.

Defaults None

Example

```
BASR# configure interface adsl 1 service-domain 1 mac-lock first
```

Related Commands mac-lock enable on page 4-7
 clear mac-lock {<port-range> <domain-range> | all} on page 4-11
 show mac-lock {<port-range> <domain-range> | all} on page 4-12
 show locking {<port-range> <domain-range> | all} on page 4-24

```
configure mac-lock learning {<port-range> <domain-range>} [1-8]
```

Summary Lock an ADSL port and service domain to up to eight MAC addresses that have been dynamically detected on the virtual interface.

Required Mode Global Config

User Entered Parameters **<port-range>**

The range of ports for which you want to configure dynamic MAC locking, where the start and end port in the range can be any port index from 1–48.

Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) to be configured for dynamic MAC locking, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

[1-8]

Number of addresses to lock, from 1–8 per virtual interface. If this optional parameter is not specified, the highest allowable number of addresses (8) is used.



CAUTION: Before running the configure mac-lock learning command, ensure that all customer equipment (modems and set top boxes) is on-line. You can perform the “show mac-addr-table” command to see the learned MAC addresses that are currently associated with each ADSL port and service-domain. See “show mac-addr-table adsl {<port-range> <domain-range>} on page 10-6” for more information.

If necessary, you can clear the source MAC address table for the port to ensure that you have up to date information before performing the command. See “clear mac-addr-table adsl {<port-range> <domain-range>} on page 10-9” for more information

Description This command configures MAC locking on a range of ADSL ports and service domains, based on dynamically learned addresses that are currently in the BAS’s source address table. Performing this command locks each port/service domain to multiple MAC addresses in the BAS’s learned source address table for each virtual interface. You can specify the number of MAC addresses (up to eight) to lock by using an optional parameter.

Note that MAC addresses are locked based upon the contents of the source address table *at the time* the command is performed. If fewer than the specified number of learned addresses are detected on the virtual interface, the remaining number will not be learned. No new addresses will be locked *after* the command is performed.

4.4

MAC Address, OUI, and IP Address Locking Commands



NOTE: If you specify a dynamic MAC locking command with a range that includes a port/service domain that already has static MAC locking configured, any learned addresses detected on the virtual interface are also added to the locked MAC address list.

Defaults Learn eight addresses

Example

```
BASR# configure mac-lock learning 3-4 1-2 4
No learned MACs to lock on port 3, service domain 1
No learned MACs to lock on port 3, service domain 2
No learned MACs to lock on port 4, service domain 1
No learned MACs to lock on port 4, service domain 2
```

Related Commands mac-lock enable on page 4-7
clear mac-lock {<port-range> <domain-range> | all} on page 4-11

```
clear mac-lock {<port-range> <domain-range> | all}
```

Summary Clear MAC locking entries on an ADSL port and service domain range, or clear all MAC locking entries.

Required Mode Privileged Exec

User Entered *<port-range>*

Parameters The range of ports for which you want to clear MAC locking entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to clear MAC locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all

Clear MAC locking entries from all ports and service domains on the BAS.

Description This command clears MAC locking entries – both administratively entered and learned – on a specified range of ADSL ports and service domains, or clears all MAC locking entries on the BAS.

Defaults None

Example

```
BASR# clear mac-lock 3-4 1-2
```

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Related Commands mac-lock enable on page 4-7
 configure interface adsl {<port>} service-domain {<1-6>} mac-lock {<source mac>} on
 page 4-7
 configure mac-lock first {<port-range> <domain-range>} on page 4-8

```
show mac-lock {<port-range> <domain-range> | all}
```

Summary Indicates whether MAC locking is enabled or disabled, and displays all active MAC lock entries for a specified port and domain range, or for all ports and service domains on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

**User Entered
Parameters** *<port-range>*

The range of ports for which you want to display MAC locking entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to display MAC locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all

Display MAC locking entries for all ports and service domains on the BAS.

Description This command displays the current state of MAC locking on the BAS: enabled or disabled. It also displays any *active* MAC lock entries for all ports and service domains. This command does not display any information for ports/service domains that have been set to learn a MAC address, but for which no address has actually been learned. Addresses remain unlearned when either the CPE equipment has not been active, or while MAC locking is disabled (even though ports/service domains may still be configured to dynamically learn the first detected address).

Example

```

BASR# show mac-lock all

  Mac Locking is Enabled

Port : 40   Service Domain : 4   mode : mac-lock
  # of Addresses Locked : 1
Addr #: 1 --> aa:bb:cc:dd:ee:11

Port : 41   Service Domain : 5   mode : mac-lock
  # of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:11

Port : 42   Service Domain : 5   mode : mac-lock
  # of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:22

Port : 43   Service Domain : 4   mode : mac-lock
  # of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:33

BASR# show mac-lock 42-43 3-6

  Mac Locking is Enabled

Port : 42   Service Domain : 5   mode : mac-lock
  # of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:22

Port : 43   Service Domain : 4   mode : mac-lock
  # of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:33

```

Related Commands mac-lock enable on page 4-7
 configure interface adsl {<port>} service-domain {<1-6>} mac-lock {<source mac>} on page 4-7
 configure mac-lock first {<port-range> <domain-range>} on page 4-8
 configure mac-lock learning {<port-range> <domain-range>} [1-8] on page 4-10

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OUI Locking

Release 2.2 of the BAS provides OUI (Organizational Unique Identifier) locking. The IEEE assigns an OUI, consisting of the first three bytes of a MAC address, to network equipment vendors so that they can generate Universal LAN MAC addresses and Protocol Identifiers for use in Local and Metropolitan Area Network applications. For example, a Pannaway Technologies' device would have a MAC address of 00-0A-9F-xx-xx-xx (where 00-0A-9F is the OUI and xx-xx-xx represents the remaining three bytes of the device's unique MAC address).

The OUI locking feature is useful when you want to lock the port/service domain to devices from a single vendor (for example, a specific manufacturer's set top box might be locked on the port/service domain providing video services).

oui-lock enable

Summary Enable or disable MAC OUI locking on the BAS.

Required Mode Global Config

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Commands**User Entered Parameters** None**Description** This command globally enables MAC OUI locking across the BAS. This is the default state of the device.**“no” form** no oui-lock enable
The “no” form of this command disables MAC OUI locking across the BAS; however, any existing OUI lock configurations are preserved, and OUI locking configuration commands can still be performed (although they are not enforced until OUI locking is globally enabled).**Defaults** MAC OUI locking enabled**Example**

```
BASR# configure oui-lock enable
```

Related Commands configure interface adsl {<port>} service-domain {<1-6>} mac-lock {<source mac>} on page 4-7
configure mac-lock first {<port-range> <domain-range>} on page 4-8
show mac-lock {<port-range> <domain-range> | all} on page 4-12

```
configure interface adsl {<port>} service-domain {<1-6>} oui-lock {<source oui>}
```

Summary Configure an OUI locking entry on an ADSL port and service domain.**Required Mode** Interface Config**User Entered Parameters** <port>

The ADSL port (1-48) on which you want to configure an OUI locking entry.

<1-6>

The selected service domain (virtual channel), indexed 1–6.

<source oui>

The OUI (first three MAC address bytes) that you want to administratively lock to the port and service domain combination.

Description This command statically enters a source OUI that you want locked to the specified ADSL port and service domain. You can create up to eight static OUI lock entries per ADSL port and service domain.**“no” form** no configure interface adsl {<port>} service-domain {<1-6>} oui-lock {<source oui>}
The “no” form of this command deletes the OUI locking entry specified by ADSL port index, service domain index, and source OUI.**Defaults** None**Example**

```
BASR# configure interface adsl 1 service-domain 1 oui-lock 00:1E:B4
```

Related Commands mac-lock enable on page 4-7
 clear oui-lock {<port-range> <domain-range> | all} on page 4-15
 show oui-lock {<port-range> <domain-range> | all} on page 4-15

clear oui-lock {<port-range> <domain-range> | all}

Summary Clear OUI locking entries on an ADSL port and service domain range, or clear all OUI locking entries.

Required Mode Privileged Exec

User Entered Parameters <port-range>

The range of ports for which you want to clear OUI locking entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to clear OUI locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all

Clear OUI locking entries from all ports and service domains on the BAS.

Description This command clears OUI locking entries on a specified range of ADSL ports and service domains, or clears all OUI locking entries on the BAS.

Defaults None

Example

```
BASR# clear oui-lock 3-4 1-1
```

Related Commands mac-lock enable on page 4-7
 configure interface adsl {<port>} service-domain {<1-6>} oui-lock {<source oui>} on page 4-14
 show oui-lock {<port-range> <domain-range> | all} on page 4-15

show oui-lock {<port-range> <domain-range> | all}

Summary Indicates whether OUI locking is enabled or disabled, and displays all active OUI lock entries for a specified port and domain range, or for all ports and service domains on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters <port-range>

The range of ports for which you want to display OUI locking entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5).

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Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to display OUI locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all

Display OUI locking entries for all ports and service domains on the BAS.

Description This command displays the current state of OUI locking on the BAS: enabled or disabled. It also displays any OUI lock entries for all ports and service domains.

Example

```
BASR# show oui-lock all

OUI Locking is Enabled

Port : 30   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

Port : 31   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

Port : 32   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

BASR# show oui-lock entries 30-32 1-6

OUI Locking is Enabled

Port : 30   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

Port : 31   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

Port : 32   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d
```

Related Commands oui-lock enable on page 4-13
configure interface adsl {<port>} service-domain {<1-6>} oui-lock {<source oui>} on page 4-14

IP Address Locking

For release 2.2 of the BAS, IP address locking supports up to eight, statically entered IP locking entries per ADSL port/service domain combination. The IP address can be either a source IP address or destination IP address.

Source IP Address Locking Commands The following commands are used to configure, clear, and view source IP address locking.

ip-lock enable

Summary Enable or disable source IP address locking on the BAS.

Required Mode Global Config

User Entered Parameters None

Description This command enables source IP address locking to be configured on the BAS. This is the default state of the device.

“no” form no ip-lock enable
The “no” form of this command disables source IP locking across the BAS, although IP locking can still be configured, and any pre-existing lock configurations are retained.

Defaults Source IP address locking enabled

Example

```
BASR# configure ip-lock enable
```

Related Commands configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>} [
<source mac-address>] on page 4-17
show ipdst-lock all on page 4-22

```
configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>} [  
source mac-address>]
```

Summary Configure a source IP locking entry on an ADSL port and service domain.

Required Mode Interface Config

User Entered Parameters **<port>**
The ADSL port (1-48) on which you want to configure an IP locking entry.

<1-6>
The selected service domain (virtual channel), indexed 1–6.

<source ip-address>
The source IP address that you want to administratively lock to the port and service domain combination.

<source mac-address>
If you specify an optional source mac-address, the locking entry is bound to the Source IP/Source MAC address combination.

- If no MAC address is specified, ARP packets from any source MAC address are allowed through the port prior to the end system retrieving its IP address.
- If a MAC address is specified, only ARP packets from the specified source MAC address are allowed through the port prior to the end system retrieving its IP address.

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Description Use this command to enter a source IP address that you want locked to the specified ADSL port and service domain. Optionally, you can enter a source MAC address to associate with the IP entry, so that only a specified MAC address can issue ARP packets. You can create up to eight source IP lock entries per ADSL port and service domain.

“no” form no configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>} [<source mac-address>]
The “no” form of this command deletes the IP locking entry specified by ADSL port index, service domain index, and source IP address, and optional source MAC address.

Defaults None

Example

```
BASR# configure interface adsl 1 service-domain 1 ip-lock 172.16.1.99 00:12:34:ab:cd:bb
```

Related Commands ip-lock enable on page 4-17
clear ip-lock {<port-range> <domain-range> | all} on page 4-18
show ipdst-lock all on page 4-22
show locking {<port-range> <domain-range> | all} on page 4-24

```
clear ip-lock {<port-range> <domain-range> | all}
```

Summary Clear source IP locking entries on a specified ADSL port and service domain range, or clear all source IP locking entries from the BAS.

Required Mode Global Config

User Entered Parameters

<port-range>
The range of ports for which you want to clear source IP locking entries, where the start and end port can be any port index from 1–48. Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to clear source IP locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all

Clear source IP locking entries from all ports and service domains on the BAS.

Description This command clears all source IP locking entries on a specified range of ADSL ports and service domains, or across all ports and service domains.

Defaults None

Example

```
BASR# clear ip-lock 40-45 1-4
```


Related Commands ip-lock enable on page 4-17
 configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>}
 [<source mac-address>] on page 4-17

```
show ip-lock all
```

Summary Indicates whether source IP locking is enabled or disabled, and displays all active source IP lock for all ports and service domains on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the current state of source IP locking on the BAS: enabled or disabled. It also displays any source IP lock entries for all ports and service domains, along with any optional source MAC address that is associated with an IP lock entry.

Example

```
BASR# show ip-lock all

IP Locking is Enabled

Port : 44   Service Domain : 3   mode : ip-lock
# of Addresses Locked : 1
Addr #: 1 --> 123.123.123.100, no MAC address configured with this IP

Port : 45   Service Domain : 3   mode : ip-lock
# of Addresses Locked : 2
Addr #: 1 --> 123.123.123.101, no MAC address configured with this IP
Addr #: 2 --> 123.123.123.102, locked along with MAC address aa:bb:cc:11:22:33

10.11.2.7# show ip-lock 38-40 5-6

IP Locking is Enabled

Port : 39   Service Domain : 5   mode : ip-lock
# of Addresses Locked : 1
Addr #: 1 --> 100.100.199.15, locked along with MAC address bb:11:aa:ee:23:af
```

Related Commands ip-lock enable on page 4-17
 configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>}
 [<source mac-address>] on page 4-17
 show ipdst-lock entries {<port-range> <domain-range>} on page 4-23
 show locking {<port-range> <domain-range> | all} on page 4-24

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```
show ip-lock entries {<port-range> <domain-range>}
```

Summary Indicates whether source IP locking is enabled or disabled, and displays all active source IP lock entries for a specified port and domain range on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters *<port-range>*

The range of ports for which you want to display source IP locking entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to display source IP locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

Description This command displays the current state of source IP locking on the BAS: enabled or disabled. It also displays any IP lock entries for all ports and service domains, along with any optional source MAC address that is associated with an IP lock entry.

Example

```
BASR# show ip-lock entries 38-40 5-6
```

```
IP Locking is Enabled
```

```
Port : 39 Service Domain : 5 mode : ip-lock
```

```
# of Addresses Locked : 1
```

```
Addr #: 1 --> 100.100.199.15, locked along with MAC address bb:11:aa:ee:23:af
```

Related Commands ip-lock enable on page 4-17
configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>}
[<source mac-address>] on page 4-17
show ipdst-lock all on page 4-22
show locking {<port-range> <domain-range> | all} on page 4-24

Destination IP Address Locking Commands The following commands are used to configure, clear, and view destination IP address locking.

ipdst-lock enable

Summary Enable or disable destination IP address locking on the BAS.

Required Mode Global Config

User Entered Parameters None

Description This command enables destination IP address locking to be configured on the BAS. This is the default state of the device.

4.4

MAC Address,
OUI, and IP
Address Locking
Commands

“no” form no ipdst-lock enable

The “no” form of this command disables destination IP address locking across the BAS, although destination IP locking can still be configured, and any pre-existing lock configurations are retained.

Defaults Destination IP address locking enabled

Example

```
BASR# configure ipdst-lock enable
```

Related Commands configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>} [<source mac-address>] on page 4-17
show ipdst-lock all on page 4-22

```
configure interface adsl {<port>} service-domain {<1-6>} ipdst-lock {<destination ip-address>}
```

Summary Configure a destination IP locking entry on an ADSL port and service domain.

Required Mode Interface Config

User Entered *<port>*

Parameters The ADSL port (1-48) on which you want to configure a destination IP address locking entry.

<1-6>

The selected service domain (virtual channel), indexed 1–6.

<destination ip-address>

The destination IP address that you want to administratively lock to the port and service domain combination.

Description Use this command to enter a destination IP address that you want locked to the specified ADSL port and service domain. You can create up to eight destination IP lock entries per ADSL port and service domain.

“no” form no configure interface adsl {<port>} service-domain {<1-6>} ipdst-lock {<destination ip-address>}

The “no” form of this command deletes the destination IP locking entry specified by ADSL port index and service domain index, and destination IP address.

Defaults None

Example

```
BASR# configure interface adsl 1 service-domain 1 ipdst-lock 172.16.1.200
```

Related Commands ipdst-lock enable on page 4-20
clear ipdst-lock {<port-range> <domain-range> | all} on page 4-22
show ipdst-lock all on page 4-22
show locking {<port-range> <domain-range> | all} on page 4-24

4.4

MAC Address,
OUI, and IP
Address Locking
Commands

```
clear ipdst-lock {<port-range> <domain-range> | all}
```

Summary Clear destination IP locking entries on a specified ADSL port and service domain range, or clear all destination IP locking entries from the BAS.

Required Mode Global Config

User Entered Parameters **<port-range>**
The range of ports for which you want to clear destination IP locking entries, where the start and end port can be any port index from 1–48. Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>
The range of service domains (for the above port range) for which to clear destination IP locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all
Clear destination IP locking entries from all ports and service domains on the BAS.

Description This command clears all destination IP locking entries on a specified range of ADSL ports and service domains, or across all ports and service domains.

Defaults None

Example

```
BASR# clear ipdst-lock all
```

Related Commands ipdst-lock enable on page 4-20
configure interface adsl {<port>} service-domain {<1-6>} ipdst-lock {<destination ip-address>} on page 4-21

```
show ipdst-lock all
```

Summary Indicates whether destination IP locking is enabled or disabled, and displays all active IP lock for all ports and service domains on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the current state of IP locking on the BAS: enabled or disabled. It also displays any IP lock entries for all ports and service domains, along with any optional source MAC address that is associated with an IP lock entry.

Example

```

BASR# show ipdst-lock all

IP Destination Locking is Enabled

Port : 4   Service Domain : 3   mode : ip-dst-lock
# of Addresses Locked : 1
Addr #: 1 --> 200.200.200.200

Port : 4   Service Domain : 6   mode : ip-dst-lock
# of Addresses Locked : 1
Addr #: 1 --> 111.111.111.111

```

Related Commands ipdst-lock enable on page 4-20
 configure interface adsl {<port>} service-domain {<1-6>} ipdst-lock {<destination ip-address>} on page 4-21
 show ipdst-lock entries {<port-range> <domain-range>} on page 4-23
 show locking {<port-range> <domain-range> | all} on page 4-24

```
show ipdst-lock entries {<port-range> <domain-range>}
```

Summary Indicates whether destination IP locking is enabled or disabled, and displays all active destination IP lock entries for a specified port and domain range on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters **<port-range>**
 The range of ports for which you want to display destination IP locking entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>
 The range of service domains (for the above port range) for which to display destination IP locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

Description This command displays the current state of destination IP locking on the BAS: enabled or disabled. It also displays any destination IP lock entries for all ports and service domains.

4.4

MAC Address, OUI, and IP Address Locking Commands

4.4

MAC Address,
OUI, and IP
Address Locking
Commands**Example**

```
BAS_10.11.4.7# show ipdst-lock entries 1-5 2-6
```

```
IP Destination Locking is Enabled
```

```
Port : 4   Service Domain : 3   mode : ip-dst-lock
# of Addresses Locked : 1
Addr #: 1 --> 200.200.200.200
```

```
Port : 4   Service Domain : 6   mode : ip-dst-lock
# of Addresses Locked : 1
Addr #: 1 --> 111.111.111.111
```

Related Commands ipdst-lock enable on page 4-20
 configure interface adsl {<port>} service-domain {<1-6>} ipdst-lock {<destination ip-address>}
 on page 4-21
 show ipdst-lock all on page 4-22
 show locking {<port-range> <domain-range> | all} on page 4-24

**MAC and IP Locking
Commands**

You can use the following command to display all locking entries configured on the BAS (both MAC locking and IP locking).

```
show locking {<port-range> <domain-range> | all}
```

Summary Indicates whether source MAC locking and IP locking are enabled or disabled, and displays all active MAC and IP lock entries for a specified port and domain range, or for all ports and service domains on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

**User Entered
Parameters****<port-range>**

The range of ports for which you want to display source MAC and IP locking entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to display source MAC and IP locking entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all

Display source MAC and IP locking entries for all ports and service domains on the BAS.

Description This command displays the current state of IP locking on the BAS: enabled or disabled. It also displays any IP lock entries for all ports and service domain. Note that this command does *not* display any optional MAC address that is associated with an IP lock entry.

Example

```

BASR# show locking all

Mac Locking is Enabled
OUI Locking is Enabled
IP Locking is Enabled
IP Destination Locking is Enabled

Port : 4   Service Domain : 3   mode : ip-dst-lock
# of Addresses Locked : 1
Addr #: 1 --> 200.200.200.200

Port : 4   Service Domain : 6   mode : ip-dst-lock
# of Addresses Locked : 1
Addr #: 1 --> 111.111.111.111

Port : 28   Service Domain : 1   mode : ip-lock
# of Addresses Locked : 1
Addr #: 1 --> 111.222.123.213

Port : 30   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

Port : 31   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

Port : 32   Service Domain : 1   mode : oui-lock
# of Addresses Locked : 1
Addr #: 1 --> 00:00:1d

Port : 39   Service Domain : 5   mode : ip-lock
# of Addresses Locked : 1
Addr #: 1 --> 100.100.199.15

Port : 40   Service Domain : 4   mode : mac-lock
# of Addresses Locked : 1
Addr #: 1 --> aa:bb:cc:dd:ee:11

Port : 41   Service Domain : 5   mode : mac-lock
# of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:11

Port : 42   Service Domain : 5   mode : mac-lock
# of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:22

Port : 43   Service Domain : 4   mode : mac-lock
# of Addresses Locked : 1
Addr #: 1 --> bb:aa:cc:ee:dd:33

Port : 44   Service Domain : 3   mode : ip-lock
# of Addresses Locked : 1
Addr #: 1 --> 123.123.123.100

Port : 45   Service Domain : 3   mode : ip-lock
# of Addresses Locked : 2
Addr #: 1 --> 123.123.123.101
Addr #: 2 --> 123.123.123.102

```

4.4*MAC Address,
OUI, and IP
Address Locking
Commands*

4.5

Broadband
Access Manager
Host
Configuration
Commands

Related Commands

- mac-lock enable on page 4-7
- oui-lock enable on page 4-13
- ip-lock enable on page 4-17
- ipdst-lock enable on page 4-20
- configure interface adsl {<port>} service-domain {<1-6>} mac-lock {<source mac>} on page 4-7
- configure mac-lock first {<port-range> <domain-range>} on page 4-8
- configure mac-lock learning {<port-range> <domain-range>} [1-8] on page 4-10
- configure interface adsl {<port>} service-domain {<1-6>} oui-lock {<source oui>} on page 4-14
- configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>} {<source mac-address>} on page 4-17
- configure interface adsl {<port>} service-domain {<1-6>} ipdst-lock {<destination ip-address>} on page 4-21

4.5 Broadband Access Manager Host Configuration Commands

These commands let you specify and view Broadband Access Manager hosts that are allowed to perform back-up and restore operations on the BAS.

```
bam host {<bam-host-ip | bam-hostname>}
```

Summary Authorize a Broadband Access Manager host to manage this BAS.

Required Mode Global Config

User Entered Parameters *<bam-host-ip / bam-hostname>*
The identity of a Broadband Access Manager (BAM) host that can be accessed over the Internet. The BAM host can be identified via its IP address (in dotted-decimal format), or via its Internet hostname if a DNS server has been configured for the BAS.

Description This command authorizes a Broadband Access Manager host to perform file upload and download operations to manage this BAS.



NOTE: Any BAM host, regardless of whether or not it is an authorized host for the BAS, can discover and manage the BAS via SNMP MIB-II. This command only determines whether the BAM host can perform file upload and download operations for the BAS.

“no” form no bam host {<bam-host-ip | bam-hostname>}
The “no” form of this command deletes a previously specified BAM host (as identified by IP address or hostname).

Defaults None

Example

```
BASR(config)# bam host 172.16.1.181
```

Related Commands show bam host on page 4-27


```
show bam host
```

Summary Displays all authorized BAM hosts.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays all BAM hosts that are authorized to perform file upload/download operations to manage this BAS.

Example

```
BASR(config)# show bam host
Allowed BAM Hosts
-----
172.16.1.181
```

Command Output The output of this command is a list of IP addresses that identify all authorized BAM hosts.

Related Commands `bam host {<bam-host-ip | bam-hostname>}` on page 4-26

4.6

Session Security Commands

4.6 Session Security Commands

The following commands provide added security for local terminal and remote Telnet/SSH login sessions with the BAS.

Security Configuration Commands

Use the following commands to configure local and remote session security against unauthorized log-ins.

```
login-attempts {<3-6>}
```

Summary Sets the number of failed log-in attempts before a configurable lock-out interval is put in effect.

Required Mode Global Config

User Entered Parameters **<3-6>**
The number of failed log-in attempts before a system lock-out takes effect.

Description Use this command to configure the number of failed log-in attempts before a system lock-out takes effect. When the system is locked out, all local and remote access (Telnet/SSH/Console) to the system is denied for the period defined by the lockout-interval parameter.

“no” form `no login-attempts`
The “no” form of this command sets the number of failed log-in attempts back to the default value of five (5).

Defaults Failed attempts: 5

4.6

Session
Security
Commands**Example**

```
BASR(config)# login-attempts 4
```

Related Commands `lockout-interval {<3-15>}` on page 4-28

```
lockout-interval {<3-15>}
```

Required Mode Global Config

User Entered `<3-15>`

Parameters The number of minutes for which a system lock-out is in effect.

Description Use this command to configure the duration (in minutes) for which a system lockout is in effect after the threshold of failed log-in attempts has been exceeded. When the system is locked out, all local and remote access (Telnet/SSH/Console) is denied.

“no” form `no lockout-interval`

The “no” form of this command sets the number of minutes back to the default value of five (5).

Defaults Lockout interval minutes: 5

Example

```
BASR(config)# lockout-interval 15
```

Related Commands `login-attempts {<3-6>}` on page 4-27

**Security Display
Commands**

Use the following commands to display security settings.

```
show login-attempts
```

Summary Displays the number of configured log-in attempts before lock-out.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered None

Description This command displays the number of log-in attempts allowed before a configurable lock-out interval takes effect.

Example

```
10.11.2.5# show login-attempts
```

```
Number of failed login attempts before lockout: 5
```

Related Commands `login-attempts {<3-6>}` on page 4-27

Summary Displays the configured lock-out interval.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the duration of the lock-out interval that effect after the log-in attempt threshold is exceeded.

Example

```
10.11.2.5# show lockout-interval
Lockout interval: 3 minutes
```

Related Commands `lockout-interval {<3-15>}` on page 4-28

4.6

*Session
Security
Commands*

4.6

Session Security Commands

Chapter 5

Session Control



This chapter describes the commands that control the function of the BAS serial interface (console port) and the operation of local terminal sessions and remote telnet or SSH sessions to the BAS.

5.1 Contents of this Chapter

The following topics are discussed in this chapter:

Topic	on page
Session Control Commands	5-1
Session Security Commands	5-1
Open Remote Session Command	5-8
Session Monitoring, Display, and Security Commands	5-9

5.2 Session Control Commands

Session control commands are used to change the serial port settings for the BAS, and view current settings. You must be in Line Config mode to configure the console interface. The Line Config mode also allows you to control the terminal display via various commands.

This section also describes the User Exec and Privileged Exec commands used to control session privileges, and to end a log-in session.

It also describes how to change the CLI prompt that is visible during a management session.

5.2

Session Control
Commands**Serial Port Settings
Commands**

The following commands are used to configure and display serial port settings.

```
serial baudrate {<baudrate>}
```

Summary Specify the baud rate setting of the BAS console port.

Required Mode Line Config

**User Entered
Parameters** <baudrate>

A value that determines the baud rate of the serial connection. One of the following bit per second (bps) values must be set for the serial interface's operation: 9600, 14400, 19200, 38400, 57600, or 115200.

Description This command sets the serial baud rate for the BAS management interface. The BAS must be rebooted for a baud rate setting change to take effect. When you change the setting via the "baud rate" command, a message appears to confirm the new setting and you are prompted whether to reboot the BAS.

"no" form no serial baudrate

The "no" form of this command restores the default baud rate setting of 9600. A message prompt appears to confirm the setting.

Defaults baudrate = 9600



CAUTION: To perform SIP logging, the baud rate must be set to 57600 bps or higher rather than the default 9600 bps. See "log {destination} {subsystem} {priority}" on page 15-13 for information on configuring SIP logging.

Example

```
BASR(Line)# serial baudrate 115200
```

```
This will set the baud rate to 115200 (yes/no)? y
```

```
Baud rate has been set to 115200, this will not take effect until after a system  
reboot.
```

```
Would you like to reboot now (yes/no)?
```

Related Commands show serial on page 5-2

```
show serial
```

Summary Displays the baud rate setting of the serial port and other communications parameters.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

**User Entered
Parameters** None

Description This command displays the baud rate setting of the serial port, and other communications parameters used for session control. The baud rate is the only configurable setting.

Example

```
BASR(Line)# show serial

Baud Rate (bps)..... 115200
Character Size (bits).... 8
Flow Control..... Disable
Stop Bits..... 1
Parity..... none
```

Command Output The following information is displayed.

Baud Rate (bps)	The baud rate setting of the serial port.
Character Size (bits)	The number of bits in a character. The number of bits is always 8.
Flow Control	Indicates that Hardware Flow-Control is disabled (factory set).
Stop Bits	The number of Stop bits per character; this is always set to 1.
Parity	The Parity method used on the Serial Port (always set to None).

Related Commands serial baudrate {<baudrate>} on page 5-2

**Remote Session
Control Commands**

The following commands are used to enable or disable access to the BAS via remote Telnet or SSH sessions, and to control local (console) output to the remote session.

ip telnet

Summary Enables Telnet sessions with the BAS.

Required Mode Global Config

**User Entered
Parameters** None

Description This command enables Telnet sessions with the BAS. Telnet is considered insecure communication, because all information is passed across the wire in plain text (including authentication information).

“no” form no ip telnet
The “no” form of this command disables Telnet sessions with the BAS.



CAUTION: Performing the no command does not disconnect any Telnet sessions currently in progress.

Defaults Telnet mode is enabled

Example

```
BASR(config)# ip telnet
```

Related Commands show remotecon on page 5-9
who on page 5-10

5.2

Session Control
Commands

ip ssh

Summary Enables Secure Shell (SSH) sessions with the BAS.

Required Mode Global Config

User Entered Parameters None

Description This command enables SSH sessions with the BAS. SSH provides secure access to the BAS, as commands and passwords are encrypted on the wire, and transactions performed by both ends of the client/server connection are authenticated.

“no” form no ip ssh
The “no” form of this command disables SSH sessions with the BAS.



CAUTION: Performing the no command does not disconnect any SSH sessions currently in progress.

Defaults SSH mode is enabled

Example

```
BASR(config)# ip ssh
```

Related Commands show remotecon on page 5-9
who on page 5-10

remotecon timeout {<0-160>}

Summary Configures the timeout value for SSH or Telnet sessions with the BAS.

Required Mode Global Config

User-Entered Parameters **<0-160>**

The maximum time (in minutes) that an inactive remote Telnet session can remain connected. The range for this parameter is 0 to 160, with a value of 0 indicating an infinite maximum time.

Description This command sets the remote connection session timeout value, in minutes. Once a remote Telnet or SSH session passes the timeout value, it is deactivated and disconnected.

“no” Form no remotecon timeout
The “no” form of this command restores the remote connection session timeout value to the default value of 5 minutes.

Defaults Timeout: 5

Example

```
BASR(config)# remotecon timeout 60
```

Related Commands show remotecon on page 5-9
who on page 5-10

5.2*Session Control
Commands***Terminal Output
Commands**

The following commands are used to control terminal output.

```
cls
```

Summary Clears the screen contents.

Required Mode User Exec, Privileged Exec, Global Config, Interface Config, or Line Config

**User Entered
Parameters** None

Description Entering this command clears all contents on the screen, and displays a new command prompt (in your current execution mode).

Defaults None

Example

```
BASR# cls
```

```
echo {<text to echo>}
```

Summary Repeats the terminal input.

Required Mode User Exec, Privileged Exec, Global Config, Interface Config, or Line Config

**User Entered
Parameters** *<text to echo>*
The user input to be repeated on the next line.

Description Repeats the text typed in <text to echo> back on the screen, immediately below the entered command.

Defaults None

Example

```
BASR# echo this text on the next line
this text on the next line
```

5.2

Session Control
Commands

more

Summary Enable showing command output page by page.**Required Mode** Privileged Exec**User Entered Parameters** None**Description** When you perform this command, output displayed as a result of a command is subject to “paging”, so that it is only displayed one screen at a time and a prompt is displayed to continue paging the output.**“no” form** no more
The “no” form of this command disables command output paging, so that the complete output is scrolled on the terminal.**Defaults** None**Example**

BASR# more

System CLI Prompt Command The following command allows you to change the BAS CLI’s prompt.

prompt {<prompt_string>}

Summary Changes the CLI prompt.**Required Mode** Global Config**User Entered Parameters** *<prompt_string>*
A text string to be used as the CLI prompt. The range is from 1 to 16 alphanumeric characters, including spaces (see the note below).**NOTE:** You must surround the text string in quotation marks (“ ”) to use spaces in entry. If you enter a space in the text string without using surrounding quotes, you get a bad command error.**Description** This command changes the text string that is presented as the command line prompt.**“no” form** no prompt
The “no” form of this command restores the default command line prompt.**Defaults** The default prompt string is BASR**Example**BASR# prompt CAB5_BAS
CAB5_BAS#

Session Privilege and Log-in Commands

The following commands are used to determine session privileges, and to log-in and log-out of terminal sessions.

enable

Summary Enters Privileged Exec mode.

Required Mode User Exec

User Entered Parameters None

Description Use this command to enter privileged command execution (Privileged Exec) mode. Privileged Exec mode is indicated by the BASR# command prompt. You can password-protect the privileged mode via the “users passwd enable” command. The default password is *pannaway* (case sensitive).

Defaults None

Example

```
BAS> enable
Password: *****
BASR#
```

Related Commands disable on page 5-7
users passwd {<username> | enable} on page 4-2

disable

Summary Exits Privileged Exec mode.

Required Mode Privileged Exec

User Entered Parameters None

Description Use this command to exit Privileged Exec mode, and return to User Exec mode (indicated by the > prompt).

Defaults None

Example

```
BASR# disable
BAS>
```

Related Commands enable on page 5-7

5.2

Session Control Commands

5.3

Open Remote
Session
Command

logout

Summary Exits the current management session.

Required Mode User Exec or Privileged Exec

User Entered Parameters None

Description This command logs you out of the current CLI session. If you are logged in via a Telnet session, entering the command ends the Telnet session. If you are logged in via a local console session, entering this command logs you out and forces you to log back in at the *Username:* and *Password:* prompts.

Defaults None

Example

```
BASR# logout
Username:
```

Related Commands users name {<username>} on page 4-1
users passwd {<username> | enable} on page 4-2

5.3 Open Remote Session Command

The following command can be used to open a remote session to an external host from within a BAS management session.

telnet {<ip_address> | <host>}

Summary Opens a telnet session to a remote host from within the current terminal or remote login session.

Required Mode Global Config

User Entered Parameters {<ip_address> | <host>}
The IP address or the fully-qualified domain name of the host with which you want to open a Telnet session.

Description This command opens a Telnet session between a BAS and a remote host. Telnet is considered insecure communication, because all information is passed across the wire in plain text (including authentication information).

Example

```
BASR# telnet 192.168.199.199
Trying 192.168.199.199...
Connected to 192.168.199.199.
Exit character is '^]'.
Username: Admin
Password:
```

5.4 Session Monitoring, Display, and Security Commands

The following commands are used to show session history, show current user sessions, and terminate a remote log-in session.

history

Summary Shows a history of recent commands.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description Shows the history of commands performed in the current execution mode (up to 30 commands).

Example

```
BASR# history
1 enable
2 ping 192.168.1.1
3 ping 172.16.1.151
4 ping 172.16.1.187
5 show ip route
6 history
```

Command Output Displays a list of the last 30 commands performed, indexed from (N-30) to N, where N is the most recent command performed. Commands are indexed from 1 to N during the current log-in session.

show remotecon

Summary Show the BAS remote session support configuration.

Required Mode Global Config

User-Entered Parameters None

Description This command displays remote connection (Telnet and SSH) settings.

“no” Form None

Defaults None

Example

```
BAS(config)# show remotecon

Allow New Telnet Sessions..... Yes
Allow New SSH Sessions..... Yes
```

5.4

*Session
Monitoring,
Display, and
Security
Commands*

5.4

Session
Monitoring,
Display, and
Security
Commands

Command Output: The following commands are shown in response to the show remotecon command:

Remote Connection Login Timeout (minutes)	Indicates the number of minutes (0-160) a remote connection session is allowed to remain inactive before being logged off. A zero means there will be no timeout.
Allow New Telnet Sessions	Indicates whether Telnet remote connection sessions are allowed (Yes) or disallowed (No).
Allow New SSH Sessions	Indicates whether SSH remote connection sessions are allowed (Yes) or disallowed (No).

Related Commands ip telnet on page 5-3
ip ssh on page 5-4
remotecon timeout {<0-160>} on page 5-4

who

Summary Displays information for current log-in sessions to this BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command shows all current log-in sessions to the BAS, indicating a session identifier, the logged-in user, where the user is logged-in, and the user's current execution mode.

Example

BAS# who

Session	Date	Username	Location	Mode
0	2006-05-25 17:33:52	Admin	CONSOLE	PRIV-EXEC
1	2006-05-25 17:34:29	Admin	172.16.1.194	PRIV-EXEC

Command Output The who command displays the following output:

Session	The session identifier (used to terminate sessions).
Username	The username entered to access the BAS.
Location	If a local console connection "CONSOLE"; if a remote (Telnet) connection, the IP address of the remote host.
Mode	The current command execution mode of the logged-in user: EXEC (User Exec), PRIV-EXEC (Privileged Exec), or CONFIG (global, interface, or line configuration mode).

Related Commands kill login-session {<session-id>} on page 5-11

show access

Summary Displays information for previous log-in sessions to this BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays a record of previous log-in sessions to the BAS, indicating the time of log-in, the log-in access method, the source of the log-in, and the user name used for authentication. The last ten log-in sessions are recorded.

Example

```
BAS# show access
Time                Access Method  Location        User
-----
2006-05-24 15:22:59 TELNET        172.16.1.194    Admin
2006-05-24 15:21:39 SSH           172.16.1.194    Admin
2006-05-24 11:14:49 TELNET        172.16.1.194    Admin
2006-05-23 15:36:35 TELNET        172.16.1.194    Admin
2006-05-23 13:24:36 TELNET        10.1.2.30       Admin
2006-05-22 16:32:11 TELNET        172.16.1.194    Admin
2006-05-22 11:05:08 TELNET        10.11.2.5       Admin
2006-05-19 16:49:54 TELNET        10.11.2.3       Admin
2006-05-19 09:56:47 TELNET        10.1.2.30       Admin
2006-05-18 17:03:47 TELNET        10.11.2.5       Admin
```

Command Output The who command displays the following output:

Time	The date and time that the log-in session occurred, in "YYYY-MM-DD MM:HH:SS" format.
Access Method	The method used for log-in. If a local console connection was used, "CONSOLE" is displayed; if a remote connection was used, either "TELNET" or "SSH" is displayed.
Location	The source of the log-in. If a local console connection was used "CONSOLE" is displayed; if a remote connection was used, the IP address of the remote host is displayed.
Mode	The log-in name used to authenticate the session.

kill login-session {<session-id>}

Summary Terminate a log-in session.

Required Mode Privileged Exec

User Entered Parameters **<session-id>**
The log-in session identifier, as displayed by running the "who" command.

Description This command ends a specified log-in session (either a local console session, or a remote Telnet or SSH session).

5.4

Session
Monitoring,
Display, and
Security
Commands

Example

```
BAS# kill login-session 1
```

Related Commands [who](#) on page 5-10

5.4

*Session
Monitoring,
Display, and
Security
Commands*

Chapter 6

ADSL Commands

This chapter details the ADSL commands used to view and configure ADSL parameters for the BASR. These include commands to configure and view ADSL alarms and line profiles, as well as the commands necessary to initialize ADSL service on a line and adjust line quality. It also describes the various ADSL show commands that display error and performance information for the ADSL line.

Note that there are also commands to place ADSL ports in various loopback modes, and run a single-ended line test (SELT) or dual-ended line test (DELT) on a specified ADSL line. These commands are described in “ADSL Line Tests” on page 15-23.



NOTE: The ADSL commands do not apply to the BAS-POTS48R device.

6.1 Contents of this Chapter

The following topics are discussed in this chapter:

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6.2

ADSL Operational Modes

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Configuring ADSL2/2+ Downstream Seamless Rate Adaptation	6-146
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6.2 ADSL Operational Modes

For the 2.2 release of the Pannaway Broadband Access Switch, the following ADSL Annexes modes of operation are supported:

- The Pannaway BAS supports Annex A or Annex M operation, for usage in a POTS (copper) environment.
 - ▶ Annex A operation can be combined with any of the operating modes listed below.
 - ▶ Annex M operation can be combined with any ADSL2/ADSL2+ mode; it is not compatible with Full Rate ANSI T.413, Full Rate G.dmt, or G.lite operation.
- Full Rate ANSI T.413 (Issue 2) – Complying to the original ANSI (American National Standards Institute) for ADSL operation, allowing up to 8.192 Mbps downstream and 640 Kbps upstream.



TIP: ANSI T.413 mode should generally be used with older ADSL CPE that complies to the original ANSI specification, but does not support G.dmt (the ITU-T specification). This mode requires that a POTS splitter be used with the CPE, or be built into the CPE.

- Full Rate G.dmt (ITU-T G.992.1) – Complying to the 1999 ITU-T (International Telecommunications Union – Telecommunication Standardization Sector) G.992.1 specification for full-rate CPE (8.192 Mbps downstream and 640 Kbps upstream).



TIP: The G.dmt mode should generally be used with ADSL CPE that complies to the ITU-T G.dmt specification. This mode requires that a POTS splitter be used with the CPE, or be built into the CPE. Pannaway's PBG-ADSL has a built-in POTS splitter.

- G.lite (ITU-T G.992.2) – Complying to the ITU-T G.992.2 specification for splitterless CPE (such as a DSL modem). This is sometimes referred to as “ADSL Lite”. This mode allows data rates of up to 4 Mbps downstream and up to 800 Kbps upstream.



TIP: This mode should only be used for customers that are serviced with a data-only, non-Pannaway CPE modem that provides splitterless operation. Do not use this mode with Pannaway's PBG-ADSL CPE product.

- ADSL2 (ITU-T G.992.3) – Complying to the ITU-T G.992.3 specification for full-rate CPE (12 Mbps downstream and 1 Mbps upstream). This is also sometimes referred to as G.dmt.bis.
- ADSL2+ (ITU-T G.992.5) – Complying to the ITU-T G.992.5 specification for extended bandwidth ADSL2. This allows for rates up to 26 Mbps downstream and 1 Mbps upstream). This is also sometimes referred to as BIS plus.



TIP: The Pannaway BAS ADSL ports default to this operational setting. This mode is supported by Pannaway's PBG-ADSL and ADSL2+ modem CPE products; however, it may not be supported by DSL modems from other vendors.

- Reach Extended ADSL2+ – Complying to the ITU-T G.992.3 Annex L specification for reach-extended ADSL2/ADSL2+.

6.3 About ADSL Configuration

The following sections detail the commands used to configure ADSL on the Pannaway BAS. The Pannaway BAS is configured to inter operate with the Pannaway PBG, RGN, or PBM in ADSL2plus_ auto mode by default. Interconnecting the Pannaway PBG and the Pannaway BAS is essentially a “plug-and-play” operation, although you might need to use some ADSL commands to adjust the line and assure its service quality.

When you use the Pannaway BAS with other vendors’ CPE modems, you may need to change the default operating parameters of the ADSL ports to support those CPE (for example, an older modem that supports ANSI T.413 mode only).

These commands allow you to do the following:

- Configure a line profile for each ADSL line, in both upstream and downstream directions.
- Configure an alarm profile for each ADSL line, in both upstream and downstream directions.



TIP: You can copy and paste from the “show-running config” command output to simplify the configuration of multiple ADSL ports. To do so:

- Complete the configuration of an ADSL port (for example, Port 1).
- Perform the “show running-config” command, as described on page 15-9. The ADSL configuration of Port 1 is displayed.
- Highlight the configuration text for Port 1 and copy it.
- Enter interface configuration mode for a new port (Port 6) for example, so that the command prompt reads BASR(config-if)#.
- Paste the configuration text after the command prompt, and press Enter. All configuration commands are performed.

6.4 About ADSL Line Profiles

A “line profile” is a collection of various configuration data that can be applied to an ADSL line. The BAS currently supports *static line profiles*, which means that each ADSL line supported by the BAS has a single line profile associated with it. An ADSL line profile is organized into a series of tables of associated configuration data for the line:

- The Line Configuration Profile Table provides various ADSL line configuration commands that lets you configure transmit rate, transmit delay, and signal-to-noise ratio settings for the line. These settings are defined in the original Alarm Configuration Profile Table defined in proposed Internet Standard RFC 2662.
- The Configuration Profile Extension Table provides a single setting command that lets you configure channelization on the ADSL line. This setting, defined in the proposed Internet Standard RFC 3440 extends the original Line Configuration Profile Table defined in proposed Internet Standard RFC 2662.
- The Line Alarm Configuration Profile Table provides various ADSL line alarm configuration settings, as defined in the original Alarm Configuration Profile Table defined in proposed Internet Standard RFC 2662.
- The Alarm Configuration Profile Extension Table provides various ADSL line alarm configuration settings. These settings, defined in the proposed Internet Standard RFC 3440 extend the original Alarm Configuration Profile Table defined in proposed Internet Standard RFC 2662.
- The ADSL Line Table provides commands that effect the line as a whole, including diagnostic test and line operation settings, clock settings, and more.

6.3

About ADSL Configuration

6.5

Clear Configuration Command

A line profile is automatically created for each line when an interface is initialized. Each of these automatically created line profiles has default settings for most of the configuration data settings stored in the various ADSL profile tables; however, you may want to change these defaults for use on your network.

In some cases, you may have to take the line out of service before changing any line parameters via the ADSL commands. These cases will be noted in documentation.



NOTE: With the exception of enabling and disabling traps, you can not change any entry in the ADSL Line Profile Tables without taking the ADSL line “out of service” via the `adsllineconfprofiletable adsllineconfprofillerowstatus` command.



CAUTION: Taking an active line out of service stops communications across that line. To restore communications, you must reset the line to “active” via the `adsllineconfprofiletable adsllineconfprofillerowstatus` command.

6.5 Clear Configuration Command

The following command is a convenience command for you to undo any changes that you have performed on ADSL lines and restore them to their default state.



NOTE: This command does not effect any VLAN or Service Domain provisioning for a port; it strictly undoes any ADSL line configuration.



CAUTION: Performing this command will take an active line out of service and stop communications across that line. To restore communications, you must reset the line to active by using the `adsllineconfprofiletable adsllineconfprofillerowstatus` or the `{<port> | <port-range> | all} start [profile]` command.

```
configure interface adsl {<port> | <port-range> | all} config-clear
```

Summary Resets a port to its default profile state (taking it out of service if it is currently active), and clears existing port information from the running configuration file.

Required Mode Interface Config

User Entered Parameters `{<port> | <port-range> | all}`
Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

Description This command resets a selected port to its default profile state, undoing any ADSL configuration changes that you have performed on the port, and clearing information for that port from the running config file (you must perform a “write memory” to save these changes to the running config file). If the port is currently in service, the command sets the line to “out of service” before the changes are performed.

“no” form None

Defaults Default profile: `adsl2plus_auto`

Example

```
BASR# config interface adsl 3-9 config-clear
```

Related Commands `adslalarmconfprofiletable` `adslalarmconfprofilestatus` {active | outofservice} on page 6-72
`config interface adsl` {<port> | <port-range> | all} start [<profile>] on page 6-85

6.6

*ADSL Alarm
Configuration
Profile
Extension Table
Commands*

6.6 ADSL Alarm Configuration Profile Extension Table Commands

The following commands are used to set various alarm thresholds for the ADSL line that, when met, cause the BAS to issue a trap.



NOTE: Currently, the BAS does not support the generation of SNMP traps; however, an event that triggers a trap is flagged in the system log.

You can only configure entries in this table after you have set the ADSL line configuration for the current interface to “out of service” via the *adslalarmconfprofiletable* *adslalarmconfprofilestatus* command. Once you have set the ADSL line configuration to “out of service”, you can enter the following commands in any order. Make sure that once you have finished configuring the line, you restore the line to “active” status.

```
adslalarmconfprofileexttable adslatucthreshold15minfailedfast {<count>}
```

Summary Sets the trap threshold for the number of failed fast retrain conditions encountered by the interface (within the current 15 minute monitoring period).

Required Mode Interface Config

User Entered Parameters *<count>*
 The threshold of failed fast retrain conditions encountered by the interface within the 15 minute monitoring period before the BAS issues a trap. The range for <count> is 0 to 4,294,672,295. A value of 0 disables trap notifications.

Description This command sets the threshold for the “failed fast retrain” trap for the interface. A fast retrain allows an ADSL modem to adjust to changes in line state (particularly if another phone is picked up), so that Internet applications can re-establish a connection within 1.5 seconds of interruption. Failed fast retrains occur when there is CRC error during the retrain, there is a time-out, or the line configuration profile is unknown.

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold15minfailedfast 5
```

Related Commands `show interface adsl` {<port>} `adslalarmconfprofileexttable` on page 6-11
`show interface adsl` {<port>} pm threshold on page 6-123

6.6

ADSL Alarm
Configuration
Profile
Extension Table
Commands

```
adslalarmconfprofileexttable adslatucthreshold15minfecsl {<count>}
adslalarmconfprofileexttable adslaturthreshold15minfecsl {<count>}
adslalarmconfprofileexttable adslatucthreshold1dayfecsl {<count>}
adslalarmconfprofileexttable adslaturthreshold1dayfecsl {<count>}
```

Summary Sets the trap threshold for the number of 1 second intervals with one or more forward error correction anomalies experienced by the interface (as summed over all received bearer channels).

Required Mode Interface Config

User Entered Parameters *<count>*
The number of 1 second intervals with forward error correction second-line anomalies encountered by the interface before it issues a trap. A value of 0 disables trap notifications.

Description These commands set the threshold for the “forward error correction second-line” trap for the near end or far end, as detected by interface. A forward error correction anomaly is a corrected Reed-Solomon code word.

The command syntax differs depending on whether it applies to the near end (atu-c) or far end (atu-r) of the line, and whether the measurement interval for trap generation is the current 15 minute monitoring period (15min) or current 1 day period (1day = all monitoring periods since midnight per the system clock).

no” form no adslalarmconfprofileexttable adslatucthreshold15minfecsl
no adslalarmconfprofileexttable adslaturthreshold15minfecsl
no adslalarmconfprofileexttable adslatucthreshold1dayfecsl
no adslalarmconfprofileexttable adslaturthreshold1dayfecsl
The “no” form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold15minfecsl 100
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold1dayfecsl 9600
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofileexttable adslatucthreshold15minsesl {<seconds>}
adslalarmconfprofileexttable adslaturthreshold15minsesl {<seconds>}
adslalarmconfprofileexttable adslatucthreshold1daysesl {<seconds>}
adslalarmconfprofileexttable adslaturthreshold1daysesl {<seconds>}
```

Summary Set the threshold for the number of severely errored seconds encountered by the interface before it issues a trap.

Required Mode Interface Config

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ADSL Alarm
Configuration
Profile
Extension Table
Commands

User Entered Parameters **<seconds>**
The number of severely errored seconds encountered by the interface before it issues a trap. The range for <seconds> is 0-900 within any 15 minute period, and 0-84600 within any 1 day period. A value of 0 disables trap notifications.

Description This command sets the threshold for the “severely errored seconds” trap for the interface. A severely errored second is a one second interval with 18 or more CRC-8 anomalies, or one or more LOS (Loss of Signal) defects, or one or more SEF (Severely Errored Frame) defects, or one or more LPR (Loss of Power) defects.

The command syntax differs depending on whether it applies to the near end (atu-c) or far end (atu-r) of the line, and whether the measurement interval for trap generation is the current 15 minute monitoring period (15min) or current 1 day period (1day = all 15 minute monitoring periods since midnight per the system clock).

no” form no adslalarmconfprofileexttable adslatucthreshold15minsesl
no adslalarmconfprofileexttable adslaturthreshold15minsesl
no adslalarmconfprofileexttable adslatucthreshold1daysesl
no adslalarmconfprofileexttable adslaturthreshold1daysesl
The “no” form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold15minsesl 20
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold1daysesl 1920
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofileexttable adslatucthreshold15minuasl {<seconds>}
adslalarmconfprofileexttable adslaturthreshold15minuasl {<seconds>}
adslalarmconfprofileexttable adslatucthreshold1dayuasl {<seconds>}
adslalarmconfprofileexttable adslaturthreshold1dayuasl {<seconds>}
```

Summary Set the trap threshold for the number of unavailable seconds encountered by the interface.

Required Mode Interface Config

User Entered Parameters **<seconds>**
The number of unavailable seconds encountered by the interface before it issues a trap. The range for <seconds> is 0-900 within any 15 minute period, and 0-84600 within any 1 day period. A value of 0 disables trap notifications.

Description This command sets the threshold for the “unavailable seconds” trap for the interface. An unavailable second is a 1 second interval for which the ADSL line is unavailable. The ADSL line becomes unavailable at the onset of 10 contiguous severely errored seconds on the line (SES-L). The 10 SES-Ls are included in unavailable time. Once unavailable, the ADSL line becomes available at the onset of 10 contiguous seconds with no SES-Ls. The 10 seconds with no SES-Ls are excluded from unavailable time. A severely errored second is a 1 second interval with 18 or more CRC-8 anomalies, or one

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ADSL Alarm
Configuration
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or more LOS (Loss of Signal) defects, or one or more SEF (Severely Errored Frame) defects, or one or more LPR (Loss of Power) defects.

The command syntax differs depending on whether it applies to the near end (atu-c) or far end (atu-r) of the line, and whether the measurement interval for trap generation is the current 15 minute monitoring period (15min) or current 1 day period (1day = all 15 minute monitoring periods since midnight per the system clock).

no" form no adslalarmconfprofileexttable adslatucthreshold15minuasl
no adslalarmconfprofileexttable adslaturthreshold15minuasl
no adslalarmconfprofileexttable adslatucthreshold1dayuasl
no adslalarmconfprofileexttable adslaturthreshold1dayuasl
The "no" form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold15minuasl 40
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold1dayuasl 3840
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofileexttable adslatucthreshold1dayess {<seconds>}
adslalarmconfprofileexttable adslaturthreshold1dayess {<seconds>}
```

Summary Set the trap threshold for the number of errored seconds encountered by the interface during the current 1 day period.

Required Mode Interface Config

User Entered <seconds>

Parameters The number of errored seconds encountered by the interface before it issues a trap. The range for <seconds> is 0-84600 within any 1 day period. A value of 0 disables trap notifications.

Description This command sets the threshold for the "errored seconds" trap for the interface. The errored second parameter is a count of one-second intervals containing one or more CRC anomalies, LOS (loss of signal), SEF (severely errored frame), or LPR (loss of power) defects.

The command syntax differs depending on whether it applies to the near end (atu-c) or far end (atu-r) of the line. The measurement interval for trap generation is the current 1 day period (all 15 minute monitoring periods since midnight per the system clock).

no" form no adslalarmconfprofileexttable adslatucthreshold1dayess
no adslalarmconfprofileexttable adslaturthreshold1dayess
The "no" form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold1dayess 4000
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold1dayess 4000
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofileexttable adslatucthreshold1daylofs {<seconds>}
adslalarmconfprofileexttable adslaturthreshold1daylofs {<seconds>}
```

Summary Set the trap threshold for the number seconds detected by the interface during which it experienced loss of frame, as measured over the current 1 day period.

Required Mode Interface Config

User Entered <seconds>

Parameters The number of seconds during which the interface detects loss of frame before it issues a trap. The range for <seconds> is 0-84600 within any 1 day period. A value of 0 disables trap notifications.

Description This command sets the threshold for the “loss of frame” trap for the interface. A LOF failure is declared after 2.5 ± 0.5 seconds of contiguous SEF defect, except when an LOS defect or failure is present. A LOF failure is cleared when LOS failure is declared, or after 10 ± 0.5 s of no SEF defect.

The command syntax differs depending on whether it applies to the near end (atu-c) or far end (atu-r) of the line. The measurement interval for trap generation is the current 1 day period (all 15 minute monitoring periods since midnight per the system clock).

no” form no adslalarmconfprofileexttable adslatucthreshold1daylofs
no adslalarmconfprofileexttable adslaturthreshold1daylofs
The “no” form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold1daylofs 1000
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold1daylofs 1000
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofileexttable adslatucthreshold1daylofs {<seconds>}
```

Summary Set the trap threshold for the number seconds detected by the interface during which it experienced loss of link, as measured over the current 1 day period.

Required Mode Interface Config

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*ADSL Alarm
Configuration
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6.6

ADSL Alarm
Configuration
Profile
Extension Table
Commands**User Entered
Parameters** **<seconds>**

The number of seconds during which the interface detects loss of link before it issues a trap. The range for <seconds> is 0-84600 within any 1 day period. A value of 0 disables trap notifications.

Description This command sets the threshold for the “loss of link” trap for the interface.

The command only applies to the near end (atu-c) of the line. The measurement interval for trap generation is the current 1 day period (all 15 minute monitoring periods since midnight per the system clock).

no” form no adslalarmconfprofileexttable adslatucthreshold1dayloss
The ☐ no ☐ form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold1dayloss 500
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofileexttable adslatucthreshold1dayloss {<seconds>}
adslalarmconfprofileexttable adslaturthreshold1dayloss {<seconds>}
```

Summary Set the trap threshold for the number seconds detected by the interface during which it experienced at least one loss of signal failure, as measured over the current 1 day period.

Required Mode Interface Config

**User Entered
Parameters** **<seconds>**

The number of seconds during which the interface detects at least one loss of signal defect before it issues a trap. The range for <seconds> is 0-84600 within any 1 day period. A value of 0 disables trap notifications.

Description This command sets the threshold for the “loss of signal” trap for the interface. A near-end or far-end Loss of Signal (LOS) failure is declared after 2.5 ± 0.5 s of contiguous near-end or far-end LOS defect, or if near- or far-end LOS defect is present when the criteria for LOF failure declaration have been met as described above. A near- or far-end LOS failure is cleared after 10 ± 0.5 s of no far-end LOS defect.

The command syntax differs depending on whether it applies to the near end (atu-c) or far end (atu-r) of the line. The measurement interval for trap generation is the current 1 day period (all 15 minute monitoring periods since midnight per the system clock).

no” form no adslalarmconfprofileexttable adslatucthreshold1dayloss
no adslalarmconfprofileexttable adslaturthreshold1dayloss
The “no” form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold1dayloss 1500
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold1dayloss 1500
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofileexttable adslatucthreshold1daylprs {<seconds>}
adslalarmconfprofileexttable adslaturthreshold1daylprs {<seconds>}
```

Summary Set the trap threshold for the number seconds detected by the interface during which it experienced loss of power, as measured over the current 1 day period.

Required Mode Interface Config

User Entered <seconds>

Parameters The number of seconds during which the interface detects loss of power before it issues a trap. The range for <seconds> is 0-84600 within any 1 day period. A value of 0 disables trap notifications.

Description This command sets the threshold for the “loss of power” trap for the interface.

A near-end Loss of Power (LPR) failure is declared after 2.5 ± 0.5 s of contiguous near-end or far-end LPR primitive, and it is cleared after 10 ± 0.5 s of no near-end LPR primitive presence.

A far-end LPR failure is declared after the occurrence of a far-end LPR primitive followed by 2.5 ± 0.5 s of contiguous near-end LOS defect. A far-end LPR failure is cleared after 10 ± 0.5 s of no near-end LOS defect.

The command syntax differs depending on whether it applies to the near end (atu-c) or far end (atu-r) of the line. The measurement interval for trap generation is the current 1 day period (all 15 minute monitoring periods since midnight per the system clock).

no” form no adslalarmconfprofileexttable adslatucthreshold1daylprs
no adslalarmconfprofileexttable adslaturthreshold1daylprs
The “no” form of these commands restores the default value of 0 (trap disabled).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofileexttable adslatucthreshold1daylprs 1500
BASR(config-if)# adslalarmconfprofileexttable adslaturthreshold1daylprs 1500
```

Related Commands show interface adsl {<port>} adslalarmconfprofileexttable on page 6-11
show interface adsl {<port>} pm threshold on page 6-123

```
show interface adsl {<port>} adslalarmconfprofileexttable
```

Summary Display alarm event threshold profiles for the ADSL port.

Required Mode Global Config

6.6

*ADSL Alarm
Configuration
Profile
Extension Table
Commands*

6.6

ADSL Alarm
Configuration
Profile
Extension Table
Commands**User-Entered
Parameters** *<port>*

The ADSL port for which to display the alarm event threshold profile.

Description This command displays the current settings for alarm generation thresholds on the BAS ADSL port. These thresholds determine the number of times an event or condition may occur on the selected port before a trap is generated.

Example

```
BAS_10.11.4.7# show interface adsl 17 adslalarmconfprofileexttable
Port 17
adslalarmconfprofileexttable:
adslAtucThreshold15MinSesL:      0
adslAtucThreshold15MinUasL:      0
adslAturThreshold15MinSesL:      150
adslAturThreshold15MinUasL:      0
adslAtucThreshold15MinFecsL:     0
adslAtucThreshold1DayLofs:       1200
adslAtucThreshold1DayLoss:       0
adslAtucThreshold1DayLols:       0
adslAtucThreshold1DayLprs:       0
adslAtucThreshold1DayESs:        0
adslAtucThreshold1DaySesL:       4000
adslAtucThreshold1DayUasL:       0
adslAturThreshold1DayLofs:       1200
adslAturThreshold1DayLoss:       0
adslAturThreshold1DayLprs:       0
adslAturThreshold1DayESs:        0
adslAturThreshold1DaySesL:       0
adslAturThreshold1DayUasL:       0
adslAturThreshold15MinFecsL:     0
adslAtucThreshold1DayFecsL:      0
adslAturThreshold1DayFecsL:      0
```

Command Output: The following displays the trap thresholds set in the ADSL Alarm Configuration Profile Extension table:

adslAtucThreshold15MinSesL adslAturThreshold15MinSesL adslAturThreshold1DaySesL	Number of Severely Errored Seconds Line conditions that the ADSL port may experience at the near-end (atu-c) or far-end (atu-r) of the line before a trap is generated. The measurement interval is either a single 15 minute monitoring interval, or all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.
adslAtucThreshold15MinUasL adslAturThreshold15MinUasL adslAtucThreshold1DayUasL adslAturThreshold1DayUasL	The number of Unavailable Seconds Line conditions that the ADSL port may experience at the near-end (atu-c) or far-end (atu-r) of the line before a trap is generated. The measurement interval is either a single 15 minute monitoring interval, or all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.
adslAtucThreshold15MinFecsL adslAturThreshold15MinFecsL adslAtucThreshold1DayFecsL adslAturThreshold1DayFecsL	The number of Forward Error Correction second-line anomalies that the ADSL port may experience at the near-end (atu-c) or far-end (atu-r) of the line before a trap is generated. The measurement interval is either a single 15 minute monitoring interval, or all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.

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ADSL Alarm
Configuration
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adslAtucThreshold1DayLofs	The number of Loss of Frame seconds that the ADSL port may experience at the near-end (atu-c) of the line before a trap is generated. The measurement interval is all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.
adslAtucThreshold1DayLoss adslAturThreshold1DayLoss	The number of Loss of Signal seconds that the ADSL port may experience at the near-end (atu-c) or far-end (atu-r) of the line before a trap is generated. The measurement interval is all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.
adslAtucThreshold1DayLols adslAturThreshold1DayLols	The number of Loss of Link seconds that the ADSL port may experience at the near-end (atu-c) or far-end (atu-r) of the line before a trap is generated. The measurement interval is all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.
adslAtucThreshold1DayLprs adslAturThreshold1DayLprs	The number of Loss of Power seconds that the ADSL port may experience at the near-end (atu-c) or far-end (atu-r) of the line before a trap is generated. The measurement interval is all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.
dslAtucThreshold1DayEss dslAturThreshold1DayEss	The number of Errored seconds that the ADSL port may experience at the near-end (atu-c) or far-end (atu-r) of the line before a trap is generated. The measurement interval is all 15 minute monitoring intervals in the current day (after 00:00 clock time). If this displays 0, the trap is disabled.

Related Commands

adslalarmconfprofileexttable adslatucthreshold15minfecsl {<count>} on page 6-6
 adslalarmconfprofileexttable adslaturthreshold15minfecsl {<count>} on page 6-6
 adslalarmconfprofileexttable adslatucthreshold1dayfecsl {<count>} on page 6-6
 adslalarmconfprofileexttable adslaturthreshold1dayfecsl {<count>} on page 6-6
 adslalarmconfprofileexttable adslatucthreshold15minsesl {<seconds>} on page 6-6
 adslalarmconfprofileexttable adslaturthreshold15minsesl {<seconds>} on page 6-6
 adslalarmconfprofileexttable adslatucthreshold1dayesl {<seconds>} on page 6-6
 adslalarmconfprofileexttable adslaturthreshold1dayesl {<seconds>} on page 6-6
 adslalarmconfprofileexttable adslatucthreshold15minuasl {<seconds>} on page 6-7
 adslalarmconfprofileexttable adslaturthreshold15minuasl {<seconds>} on page 6-7
 adslalarmconfprofileexttable adslatucthreshold1dayuasl {<seconds>} on page 6-7
 adslalarmconfprofileexttable adslaturthreshold1dayuasl {<seconds>} on page 6-7
 adslalarmconfprofileexttable adslatucthreshold1dayess {<seconds>} on page 6-8
 adslalarmconfprofileexttable adslaturthreshold1dayess {<seconds>} on page 6-8
 adslalarmconfprofileexttable adslatucthreshold1daylofs {<seconds>} on page 6-9
 adslalarmconfprofileexttable adslaturthreshold1daylofs {<seconds>} on page 6-9
 adslalarmconfprofileexttable adslatucthreshold1daylols {<seconds>} on page 6-9
 adslalarmconfprofileexttable adslatucthreshold1dayloss {<seconds>} on page 6-10
 adslalarmconfprofileexttable adslaturthreshold1dayloss {<seconds>} on page 6-10
 adslalarmconfprofileexttable adslatucthreshold1daylprs {<seconds>} on page 6-11
 adslalarmconfprofileexttable adslaturthreshold1daylprs {<seconds>} on page 6-11

6.7

ADSL
Configuration
Profile
Extension Table

6.7 ADSL Configuration Profile Extension Table

The ADSL Configuration Profile Extension Table provides a single command that lets you configure the line type parameter in the ADSL line profile for a given interface. As noted previously, each ADSL line on the BAS has a single ADSL Line Profile Table entry associated with it.

There is also a “convenience” command that sets one or more interfaces to fast channel mode with an abbreviated command line entry.

You can only perform these commands after you have set the ADSL line configuration for the desired interface(s) to “out of service” via the *adsllineconfprofiletable* *adsllineconfprofilerowstatus* or the *no* {<port> | <port-range> | *all*} *start* command.

```
adslconfprofileexttable adslconfprofilelinetype {<linetype>}
```

Summary Sets the line type for the ADSL line profile.



CAUTION: By default, the BAS operates in ADSL2+ (supporting downstream data rates up to 24 Mbps; 26 Mbps with data boost mode enabled). In ADSL2+, the BAS defaults to *interleaved* channel only mode. You should change channel type only if you know the capabilities of the downstream CPE device.

The following channel configurations are supported between the BAS and the downstream Pannaway CPE (Pannaway PBG-ADSL or Pannaway RGN-410):

- Switching line type to *fastonly* is also supported.
- Switching line type to *fastandinterleaved* is not supported by the CPE; you lose connectivity to the CPE.
- Switching line type to *fastorinterleaved* is not supported by the CPE; you lose connectivity to the CPE.
- Switching line type to *nochannel* causes loss of contact with the CPE.

Required Mode Interface Config

User Entered Parameters <linetype>

The ADSL line type, where line type determines the configuration of the line with respect to the fast and interleaved channels:

- *nochannel* – No channels exist.
- *fastonly* – Only the fast transmission channel exists.
- *interleavedonly* – Only the interleaved transmission channel exists.
- *fastorinterleaved* – Either the fast or the interleaved transmission channel can exist, but only one or the other at any time.
- *fastandinterleaved* – Both the fast and the interleaved transmission channels can exist simultaneously.

In general, the fast channel is meant to transfer latency-critical but error tolerant data streams like real-time video. The interleaved path is slower, but with more reliable error checking, so it can be used for data that is intolerant to errors like file transfer.

Description This command determines the line type for the ADSL line.

Defaults The BAS default is for the line type to be set for *interleavedonly*.

Example

```
BASR(config-if)# adslconfprofileexttable adslconfprofilelinetype fastonly
```

Related Commands show interface adsl {<port>} adslconfprofileexttable on page 6-15

```
{<port> | <port-range> | all} fast-channel
```

Summary Sets the line type to fastonly (fast channel/low-latency mode).



CAUTION: By default, the BAS operates in ADSL2+ (supporting downstream data rates up to 24 Mbps; 26 Mbps with data boost mode enabled). In ADSL2+, the BAS defaults to *interleaved* channel only mode. You should change channel type only if you know the capabilities of the downstream CPE device.

Required Mode Interface Config or Global Config

User Entered Parameters {<port> / <port-range> / all}

In Global Config mode, selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

no" form no {<port> | <port-range> | all} fast-channel

The “no” form of this command sets the ADSL port(s) back to the default state of interleaved mode.

Example

```
BASR# config interface adsl 4-8 fast-channel
```

Related Commands adslconfprofileexttable adslconfprofilelinetype {<linetype>} on page 6-14
show interface adsl {<port>} adslconfprofileexttable on page 6-15

```
show interface adsl {<port>} adslconfprofileexttable
```

Summary Display the contents of the BAS ADSL extended Configuration Profile table.

Required Mode Global Config

User-Entered Parameters <port>

The ADSL port for which to display the extended Configuration Profile table.

Description This command provides the ADSL line's Configuration Profile setting, identifying if the line is configured to act in Fast mode or Interleaved mode.

Example

```
BASR# show interface adsl 17 adslconfprofileexttable
Port 17
adslconfprofileexttable:
adslConfProfileLineType:      interleavedOnly
```

6.7

ADSL
Configuration
Profile
Extension Table

6.8

ADSL Line
Alarm Profile
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Command Output: The field that is displayed in response to the command indicates the type(s) of channels configured on the BAS ADSL interface. For ADSL operation, only the interleaved configuration is supported. ADSL2/2+ operation supports the use of fast or interleaved channels.

Related Commands `adslconfprofileexttable adslconfprofilelinetype {<linetype>}` on page 6-14

6.8 ADSL Line Alarm Profile Table Configuration Commands

The ADSL Line Alarm Profile table contains information on the ADSL line alarm profile. You can only change ADSL line alarm profile entries in this table after you have set the ADSL line alarm profile for the current interface to “out of service” via the `adslalarmconfprofiletable adslalarmconfprofilestatus` command. Once you have set the ADSL line alarm configuration profile to “out of service”, you can enter these commands in any order.



NOTE: You can perform any commands that enable or disable traps without putting the line’s alarm profile into an “out of service state”.



NOTE: Currently, the BAS does not support the generation of SNMP traps; however, an event that triggers a trap is flagged in the system log. See *Chapter 15, “Diagnostic, Test, and Maintenance Commands”* for more information on the system log.

ATU-C (ADSL Termination Unit – Central Office) Commands

The following commands are applicable to alarms detected on the ATU-C end of the line. You can consider them to be transmit errors on the line (that is, “near-end” errors generated by the BAS itself).

`adslalarmconfprofiletable adslatucinitfailuretrapenable {enable | disable}`

Summary Enables or disables the initialization failure trap.

Required Mode Interface Config

User Entered Parameters *{enable / disable}*

The activation state of the initialization failure trap.

Description This command enables or disables the initialization failure trap for the line. This trap is triggered when the ATU-C (BASR) detects that the far-end ATU-R (PBG or other ADSL modem) failed to initialize. If the ATU-R does initialize, a corresponding “clear” trap is sent by the BASR.

“no” form `no adslalarmconfprofiletable adslatucinitfailuretrapenable`
The “no” form of this command disables the initialization failure trap for the line (the default).

Defaults Disabled

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucinitfailuretrapenable enable
```

Related Commands `show interface adsl {<port>} adslalarmconfprofiletable` on page 6-29

adslalarmconfprofiletable adslatucopstatetrapenable {enable | disable}

Summary Enables or disables the operational state trap.

Required Mode Interface Config

User Entered Parameters *{enable / disable}*
The activation state of the operational state trap.

Description This command enables or disables the operational state trap for the line. This trap is triggered when the ADSL line state changes for the provisioned line. Possible line state values are: Idle, Data (Showtime), Bootup, Handshaking, Training, Framing Sync, Local Loop Test, Fast Retrain, Digital Loop Test, Spectrum Test, or ADSL Loopback Test. The trap reports the previous line state and the current line state.



CAUTION: If you disable the operational state trap, it effects the operation of the BAS's internal software that relies on state-driven event notifications (such as operation of the LEDs). This trap should not be disabled for normal BAS operation.

"no" form no adslalarmconfprofiletable adslatucopstatetrapenable
The "no" form of this command enables the operational state trap for the line (the default).

Defaults Enabled

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucopstatetrapenable enable
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29

adslalarmconfprofiletable adslatuc thresh15miness {<seconds>}

Summary Sets the threshold for the number of errored seconds encountered on the near-end of the line (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered Parameters *<seconds>*
The number of errored seconds encountered by the interface within the 15 minute monitoring period before a trap is issued. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of errored seconds encountered on the near-end of the line within any 15 minute monitoring period before the BAS issues an ADSL trap. An errored second is a one-second interval containing one or more CRC anomalies, or one or more Loss of Signal or Severely Errored Frame defects.

"no" form no adslalarmconfprofiletable adslatuc thresh15miness
The "no" form of this command disables the errored seconds trap for the line (the default).

Defaults 0 (disabled)

6.8

ADSL Line Alarm Profile Table Configuration Commands

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucthresh15miness 100
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

6.8

ADSL Line
Alarm Profile
Table
Configuration
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```
adslalarmconfprofiletable adslatucthresh15minlofs {<seconds>}
```

Summary Sets the threshold for the number of seconds in which Loss of Framing is detected (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered Parameters **<seconds>**

The number of seconds within the 15 minute monitoring period in which Loss of Framing can be detected before the BAS issues a trap. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of Loss of Framing seconds encountered on the near-end of the line within any 15 minute monitoring period before the BAS issues an ADSL trap. A Loss of Framing second is a one-second interval containing a loss of frame defect. Loss of Frame (LOF) is declared after 2.5 +/- 0.5 seconds of contiguous severely errored frame defects. LOS overrides it. Once a LOF condition has been declared, it is cleared by 10 +/- 0.5 contiguous seconds with no Severely Errored Frame (SEF) defects.

“no” form no adslalarmconfprofiletable adslatucthresh15minlofs
The “no” form of this command disables the Loss of Framing seconds trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucthresh15minlofs 50
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofiletable adslatucthresh15minlofs {<seconds>}
```

Summary Sets the threshold for the number of seconds in which Loss of Link is detected (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered Parameters **<seconds>**

The number of seconds within the 15 minute monitoring period in which Loss of Link can be detected before the BAS issues a trap. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

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Alarm Profile
Table
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Commands

Description This command sets the threshold for the number of Loss of Link seconds encountered on the near-end of the line within any 15 minute monitoring period before the BAS issues an ADSL trap. A Loss of Link second is a one-second interval containing a Loss of Link defect. A Loss of Link is declared if a far-end Loss of Signal is not preceded by a “dying-gasp” (power-down) message from the ATU-R.

“no” form no adslalarmconfprofiletable adslatucthresh15minlols
The “no” form of this command disables the Loss of Link seconds trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucthresh15minlols 50
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adslalarmconfprofiletable adslatucthresh15minloss {<seconds>}

Summary Sets the threshold for the number of seconds in which Loss of Signal is detected (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered**Parameters**

<seconds>
The number of seconds within the 15 minute monitoring period in which near-end Loss of Signal can be detected before the BAS issues a trap. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of Loss of Signal seconds encountered on the near-end of the line within any 15 minute monitoring period before the BAS issues an ADSL trap. A Loss of Signal second is a one-second interval containing a loss of signal defect. A Loss of Signal defect indicates the received ADSL signal power is below a threshold determined immediately after successful initialization. Loss of Signal is cleared when signal power returns to at or above the threshold value.

“no” form no adslalarmconfprofiletable adslatucthresh15minloss
The “no” form of this command disables the Loss of Signal trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucthresh15minloss 50
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

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ADSL Line
Alarm Profile
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adsllinealarmconfprofiletable adslatucthresh15minlprs {<seconds>}

Summary Sets the threshold for the number of seconds in which Loss of Power is detected (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered Parameters **<seconds>**
The number of seconds within the 15 minute monitoring period in which near-end Loss of Power defects can be detected by the BAS before it issues a trap. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of seconds in which the BAS encounters loss of power defects on the near-end of the line (within any 15 minute monitoring period) before it issues an ADSL trap. A Loss of Power defect indicates the electrical supply (mains) power received by the BAS is below the manufacturer-determined power level required to ensure proper operation. Loss of Power is cleared when the electrical supply (mains) power returns to or above the manufacturer-determined level.

“no” form no adsllinealarmconfprofiletable adslatucthresh15minlprs
The “no” form of this command disables the loss of power trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adsllinealarmconfprofiletable adslatucthresh15minlprs 50
```

Related Commands show interface adsl {<port>} adsllinealarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adsllinealarmconfprofiletable adslatucthreshfastratedown {<bps change>}

Summary Sets the negative change in transmission rate on the fast channel between initializations, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered Parameters **<bps change>**
The negative transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a negative change in transmission rate (that is, a drop in transmission speed) on the line’s fast channel that causes the BAS to issue a trap upon detection.

“no” form no adsllinealarmconfprofiletable adslatucthreshfastratedown
The “no” form of this command disables the fast rate down trap (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adsllinealarmconfprofiletable adslatucthreshfastratedown 15000000
```

Related Commands show interface adsl {<port>} adsllinealarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adsllinealarmconfprofiletable adslatucthreshfastrateup {<bps change>}

Summary Sets the positive change in transmission rate on the fast channel between initializations, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered <bps change>

Parameters The positive transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a positive change in transmission rate (that is, an increase in transmission speed) on the line’s fast channel that causes the BAS to issue a trap upon detection.

“no” form no adsllinealarmconfprofiletable adslatucthreshfastrateup
The “no” form of this command disables the fast rate up trap (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adsllinealarmconfprofiletable adslatucthreshfastrateup 15000000
```

Related Commands show interface adsl {<port>} adsllinealarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adsllinealarmconfprofiletable adslatucthreshinterleavedown {<bps change>}

Summary Sets the negative change in transmission rate on the interleaved channel between initializations, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered <bps change>

Parameters The negative transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

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This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a negative change in transmission rate (that is, a drop in transmission speed) on the line's interleaved channel that causes the BAS to issue a trap upon detection.

"no" form no adslalarmconfprofiletable adslatucthreshinterleavedown
The "no" form of this command disables the interleaved rate down trap (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucthreshinterleavedown
15000000
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adslalarmconfprofiletable adslatucthreshinterleaverateup {<bps change>}

Summary Sets the positive change in transmission rate on the interleaved channel between initializations, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered <bps change>

Parameters The positive transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a positive change in transmission rate (that is, an increase in transmission speed) on the line's interleaved channel that causes the BAS to issue a trap upon detection.

"no" form no adslalarmconfprofiletable adslatucthreshinterleaverateup
The "no" form of this command disables the fast rate down trap (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslatucthreshinterleaverateup
15000000
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

ATU-R (ADSL Termination Unit – Remote) Commands

The following commands are applicable to alarms detected on the ATU-R end of the line. You can consider them to be receive errors detected at the BAS interface (that is, generated by the device on the far-end of the line).

```
adslalarmconfprofiletable adslaturthresh15miness {<seconds>}
```

Summary Sets the threshold for the number of errored seconds encountered on the far-end of the line (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered Parameters

<seconds> The number of errored seconds encountered by the interface within the 15 minute monitoring period before a trap is issued. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of errored seconds encountered on the far-end of the line within any 15 minute monitoring period before the BAS issues an ADSL trap. An errored second is a one-second interval containing one or more CRC anomalies, or one or more Loss of Signal or Severely Errored Frame defects.

“no” form no adslalarmconfprofiletable adslaturthresh15miness
The “no” form of this command disables the errored seconds trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthresh15miness 100
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

```
adslalarmconfprofiletable adslaturthresh15minlofs {<seconds>}
```

Summary Sets the threshold for the number of seconds in which loss of framing is detected (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered Parameters

<seconds> The number of seconds within the 15 minute monitoring period in which Loss of Framing can be detected before the BAS issues a trap. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of loss of framing seconds encountered on the far-end of the line within any 15 minute monitoring period before the BAS issues an ADSL trap. A Loss of Framing second is a one-second interval containing a Loss of Frame defect. Loss of Frame (LOF) is declared after 2.5 +/- 0.5 seconds of contiguous Severely Errored Frame (SEF) defects. LOS overrides it. Once a LOF condition has been declared, it is cleared by 10 +/- 0.5 contiguous seconds with no SEF.

6.8

*ADSL Line
Alarm Profile
Table
Configuration
Commands*

6.8

ADSL Line
Alarm Profile
Table
Configuration
Commands

“no” form no adslalarmconfprofiletable adslaturthresh15minlofs
The “no” form of this command disables the Loss of Framing seconds trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthresh15minlofs 50
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adslalarmconfprofiletable adslaturthresh15minloss {<seconds>}

Summary Sets the threshold for the number of seconds in which Loss of Signal is detected (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

User Entered Parameters **<seconds>**
The number of seconds within the 15 minute monitoring period in which far-end Loss of Signal can be detected before the BAS issues a trap. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of Loss of Signal seconds encountered on the far-end of the line within any 15 minute monitoring period before the BAS issues an ADSL trap. A Loss of Signal second is a one-second interval containing a Loss of Signal defect. A Loss of Signal defect indicates the received ADSL signal power is below a threshold determined immediately after successful initialization. Loss of Signal is cleared when signal power returns to at or above the threshold value.

“no” form no adslalarmconfprofiletable adslaturthresh15minloss
The “no” form of this command disables the loss of signal trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthresh15minloss 50
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adslalarmconfprofiletable adslaturthresh15minlprs {<seconds>}

Summary Sets the threshold for the number of seconds in which Loss of Power is detected (within any 15 minute monitoring period) before the BAS issues an ADSL trap.

Required Mode Interface Config

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ADSL Line
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Commands

User Entered Parameters **<seconds>**
The number of seconds within the 15 minute monitoring period in which far-end Loss of Power defects can be detected by the BAS before it issues a trap. The range for <seconds> within any 15 minute period is 0-900. A value of 0 disables trap notifications.

Description This command sets the threshold for the number of seconds in which the BAS encounters Loss of Power defects issued from the far-end of the line (within any 15 minute monitoring period) before it issues an ADSL trap. A far-end Loss of Power defect indicates that the CPE has issued at least six “dying gasp” messages to indicate that it has detected a power shut-down, and the BAS has received at least four of those “dying gasps”.

“no” form no adslalarmconfprofiletable adslaturthresh15minlprs
The “no” form of this command disables the Loss of Power trap for the line (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthresh15minlprs 50
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adslalarmconfprofiletable adslaturthreshfastratedown {<bps change>}

Summary Sets the negative change in transmission rate of the fast channel between far-end initializations, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered Parameters **<bps change>**
The negative transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a negative change in transmission rate (that is, a drop in transmission speed) at the far-end on the line’s fast channel that causes the BAS to issue a trap upon detection.

“no” form no adslalarmconfprofiletable adslaturthreshfastratedown
The “no” form of this command disables the fast rate down trap (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthreshfastratedown 15000000
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

6.8

ADSL Line
Alarm Profile
Table
Configuration
Commands

adslalarmconfprofiletable adslaturthreshfastrateup {<bps change>}

Summary Sets the positive change in transmission rate on the fast channel between far-end initializations, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered Parameters <bps change>

The positive transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a positive change in transmission rate (that is, an increase in transmission speed) at the far-end on the line's fast channel that causes the BAS to issue a trap upon detection.

"no" form no adslalarmconfprofiletable adslaturthreshfastrateup
The "no" form of this command disables the fast rate up trap (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthreshfastrateup 15000000
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adslalarmconfprofiletable adslaturthreshinterleavedown {<bps change>}

Summary Sets the negative change in transmission rate on the interleaved channel between far-end initializations, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered Parameters <bps change>

The negative transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a negative change in transmission rate (that is, a drop in transmission speed) at the far-end on the line's interleaved channel that causes the BAS to issue a trap upon detection.

"no" form no adslalarmconfprofiletable adslaturthreshinterleavedown
The "no" form of this command disables the interleaved rate down trap (the default).

Defaults 0 (disabled)

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthreshinterleavedown
15000000
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

adslalarmconfprofiletable adslaturthreshinterleaverateup {<bps change>}

Summary Sets the positive change in transmission rate on the interleaved channel between initializations at the far-end, which – when detected – causes the BAS to issue a trap.

Required Mode Interface Config

User Entered Parameters *<bps change>*

The positive transmission rate change on the line, in bits per second, which causes the BAS to issue a trap.

This is a 32-bit value (allowable range 0 – 4,294,967,295). For equivalency purposes when calculating transmission rates, 1,000,000 bps is the same as 1 Mbps. A value of 0 disables the trap.

Description This command sets a value for a positive change in transmission rate (that is, an increase in transmission speed) at the far-end on the line's interleaved channel that causes the BAS to issue a trap upon detection.

“no” form no adslalarmconfprofiletable adslaturthreshinterleaverateup
The “no” form of this command disables the fast rate down trap (the default).

Example

```
BASR(config-if)# adslalarmconfprofiletable adslaturthreshinterleaverateup
15000000
```

Related Commands show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

6.8

ADSL Line
Alarm Profile
Table
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Commands

Alarm Profile Status Command The following command is used to set the alarm profile to active or inactive.

adslalarmconfprofiletable adslalarmconfprofilerowstatus {active | outofservice}

Summary Activates or de-activates the alarm profile for the configured line.

Required Mode Interface Config

User Entered Parameters *{active / outofservice}*

Active indicates that the currently configured alarm profile should be used for the line, and outofservice indicates that the alarm profile should be made inactive for the purpose of making changes.

Description Sets the status of this line alarm profile to active or out of service (inactive).

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ADSL Line Alarm Profile Table Configuration Commands

“no” form no adsllinealarmconfprofiletable adsllinealarmconfprofilerowstatus
Sets the alarm profile to out of service (the default value).

Defaults Out of service

Example

```
BASR(config-if)# adsllinealarmconfprofiletable adsllinealarmconfprofilerowstatus active
```

Related Commands show interface adsl {<port>} adsllinealarmconfprofiletable on page 6-29
show interface adsl {<port>} pm threshold on page 6-123

ADSL Line Alarm Configuration Profile Table Reset Counters Command

The following command allows for a runtime reset of various ADSL performance counters. Note that this command is not required by ADSL standards, and is offered as a convenience if you require a reset of performance counters.

```
adsllinealarmconfprofiletable adsllinealarmcountersreset {true | false}
```

Summary Enables reset of performance counters for the specified line during BAS runtime.

Required Mode Interface Config

User Entered Parameters {true / false}

True indicates that performance counters are cleared when the command is executed. This after this value has been set, it remains displayed as “true” when the adsllinealarmconfprofiletable is displayed via a “show” command. This does not mean that the counters have just been reset; it simply indicates that this was the last value set by the user.

The value can be set to “false” to indicate that the counters have previously been cleared, but have been actively gathered since the last time the command was run.



NOTE: There is also another convenience command that just clears the performance data tables. See “clearpm” on page 6-129.

Description This command enables reset of performance counters during runtime. When this parameter is set to “true”, *all* line and channel performance counters are cleared in the following tables:

- adslAtucPerfDataTable
- adslAturPerfDataTable
- adslAtucIntervalTable
- adslAturIntervalTable
- adslAtucChanPerfDataTable
- adslAturChanPerfDataTable
- adslAtucChanIntervalTable
- adslAturChanIntervalTable
- adslAtucTraps
- adslAturTraps
- adslAtucPerfDataExtTable
- adslAtucIntervalExtTable
- adslAturPerfDataExtTable

- adslAturIntervalExtTable
- adslExtAtucTraps
- adslExtAturTraps

"no" form None

Defaults false

Example

```
BASR(config-if)# adsllinealarmconfprofiletable adsllinealarmcountersreset true
```

Related Commands show interface adsl {<port>} adsllinealarmconfprofiletable on page 6-29

6.8

ADSL Line
Alarm Profile
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ADSL Line Alarm Configuration Profile Table Show Command

The following command displays the current configuration of the Line Alarm Configuration Profile Table, for both ATU-C and ATU-R alarm settings.

```
show interface adsl {<port>} adsllinealarmconfprofiletable
```

Summary Shows the configured levels and thresholds for ADSL alarm generation.

Required Mode Global Config

User-Entered <port>

Parameters Selects the ADSL port for which to show the line alarm configuration profile table.

Description This command shows the currently configured thresholds and trap settings for the selected ADSL line.

Example

```
BASR(config)# show interface adsl 2 adsllinealarmconfprofiletable
Port2
adsllinealarmconfprofiletable:
adslAtucThresh15MinLofs:      0
adslAtucThresh15MinLoss:     0
adslAtucThresh15MinLols:     0
adslAtucThresh15MinLprs:     0
adslAtucThresh15MinESS:      0
adslAtucThreshFastRateUp:    4000
adslAtucThreshInterleaveRateUp: 4000
adslAtucThreshFastRateDown:  4000
adslAtucThreshInterleaveRateDown: 4000
adslAtucInitFailureTrapEnable: enable
adslAturThresh15MinLofs:     0
adslAturThresh15MinLoss:    0
adslAturThresh15MinLprs:    0
adslAturThresh15MinESS:     0
adslAturThreshFastRateUp:   4000
adslAturThreshInterleaveRateUp: 4000
adslAturThreshFastRateDown: 4000
adslAturThreshInterleaveRateDown: 4000
adslLineAlarmConfProfileRowStatus: active
adslAtucOpStateTrapEnable:  enable
adslAtucPmStateTrapEnable:  disable
adslLineAlarmCountersReset: false
```

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ADSL Line
Configuration
Profile Table
Commands

Related Commands

- adsllinealarmconfprofiletable adslatucinitfailuretrapenable {enable | disable} on page 6-16
- adsllinealarmconfprofiletable adslatucopstatetrapenable {enable | disable} on page 6-17
- adsllinealarmconfprofiletable adslatucthresh15miness {<seconds>} on page 6-17
- adsllinealarmconfprofiletable adslatucthresh15minlofs {<seconds>} on page 6-18
- adsllinealarmconfprofiletable adslatucthresh15minlols {<seconds>} on page 6-18
- adsllinealarmconfprofiletable adslatucthresh15minloss {<seconds>} on page 6-19
- adsllinealarmconfprofiletable adslatucthresh15minlprs {<seconds>} on page 6-20
- adsllinealarmconfprofiletable adslatucthreshfastratedown {<bps change>} on page 6-20
- adsllinealarmconfprofiletable adslatucthreshfastrateup {<bps change>} on page 6-21
- adsllinealarmconfprofiletable adslatucthreshinterleaveratedown {<bps change>} on page 6-21
- adsllinealarmconfprofiletable adslatucthreshinterleaverateup {<bps change>} on page 6-22
- adsllinealarmconfprofiletable adslaturthresh15miness {<seconds>} on page 6-23
- adsllinealarmconfprofiletable adslaturthresh15minlofs {<seconds>} on page 6-23
- adsllinealarmconfprofiletable adslaturthresh15minloss {<seconds>} on page 6-24
- adsllinealarmconfprofiletable adslaturthresh15minlprs {<seconds>} on page 6-24
- adsllinealarmconfprofiletable adslaturthreshfastratedown {<bps change>} on page 6-25
- adsllinealarmconfprofiletable adslaturthreshfastrateup {<bps change>} on page 6-26
- adsllinealarmconfprofiletable adslaturthreshinterleaveratedown {<bps change>} on page 6-26
- adsllinealarmconfprofiletable adslaturthreshinterleaverateup {<bps change>} on page 6-27
- adsllinealarmconfprofiletable adsllinealarmconfprofilerowstatus {active | outofservice} on page 6-27

6.9 ADSL Line Configuration Profile Table Commands

The following commands set the specific operating parameters for the ADSL line.



NOTE: Some commands are currently not supported in BAS firmware, although they are displayed as available line configuration profile table commands. These include: adslatucconfdownshiftsnrmgn, adslatucconfmindownshifttime, adslatucconfminupshifttime, adslatucconfupshiftsnrmgn, and adslatucconfmsgminds. Support for these commands will be added at a future date.

ATU-C Line Configuration Profile Commands

The following commands are used to specify line parameters with respect to the ATU-C direction.

```
adsllineconfprofiletable adslatucchanconfmaxtxrate {<bps>}
```

Summary Sets the maximum transmit (downstream) rate for the fast channel in bits per second (bps).

Required Mode Interface Config

**User Entered
Parameters** <bps>

An integer value, indicating the maximum transmit (downstream) rate for the fast channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for downstream transmission on the fast channel, with 1,000,000 equal to 1 Mbps.

Description This command sets the maximum transmit rate for the fast channel in the downstream direction (from the BAS to the ADSL CPE). This value only applies if the ADSL Line Type has been set to a mode with the fast channel present.

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ADSL Line
Configuration
Profile Table
Commands

“no” form no adsllineconfprofiletable adslatucchanconfmaxtxrate

The “no” form of this command sets the maximum fast channel rate (downstream) back to its default value of 32,736,000 (approximately 32.7 Mbps).

Defaults bps = 32,736,000

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucchanconfmaxtxrate 16000000
```

Related Commands adslconfprofileexttable adslconfprofilelinetype {<linetype>} on page 6-14
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucchanconfminxrate {<bps>}

Summary Sets the minimum transmit (downstream) rate for the fast channel in bits per second (bps).

Required Mode Interface Config

User Entered Parameters <bps>

An integer value, indicating the maximum transmit (downstream) rate for the fast channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for downstream transmission on the fast channel, with 1,000,000 equal to 1 Mbps.

Description This command sets the minimum transmit rate for the fast channel in the downstream direction (from the BAS to the ADSL CPE). This value only applies if the ADSL Line Type has been set to a mode with the fast channel present.

“no” form no adsllineconfprofiletable adslatucchanconfminxrate

The “no” form of this command sets the minimum fast channel rate (downstream) back to its default value of 32,000 (approximately 0.03 Mbps).

Defaults bps = 32,000

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucchanconfminxrate 1000000
```

Related Commands adslconfprofileexttable adslconfprofilelinetype {<linetype>} on page 6-14
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucchanconfinterleavemaxtxrate {<bps>}

Summary Sets the maximum transmit (downstream) rate for the interleaved channel in bits per second (bps).

Required Mode Interface Config

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ADSL Line
Configuration
Profile Table
Commands**User Entered
Parameters** **<bps>**

An integer value, indicating the maximum transmit (downstream) rate for the interleaved channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for downstream transmission on the interleaved channel, with 1,000,000 equal to 1 Mbps.

Settings can be made with the following granularity, and are rounded up to the nearest whole increment if necessary:

- 32 kbps increments for ADSL, ADSL 2, and ADSL2+ when user-entered.



NOTE: When the line actually initializes and rates are actually determined, the actual line speed is partitioned according to the following increments for ADSL:

- Below 8 Mbps, set to the closest 32 kbps increment.
- Between 8-16 Mbps, set to the closest 64 kbps increment.
- Between 16-24 Mbps, set to the closest 96 kbps increment.
- Between 24-26 Mbps, set to the closest 128 kbps increment.
- Above 26 Mbps, set to the closest 192 kbps increment.

Note also that for data rates above 8 Mbps, there is also a 32 kbps offset allocated for framing.

ADSL 2/2+ operation is partitioned in 4 or 8 kbps increments when the line rate is automatically set via rate adaptation

- 8 kbps increments for ADSL 2+ (when set automatically via rate adaptation)
- 4 kbps increments for ADSL2 (when set automatically via rate adaptation)

Description This command sets the maximum transmit rate for the interleaved channel in the downstream direction (from the BAS to the ADSL CPE). This value only applies if the ADSL Line Type has been set to a mode with the interleaved channel present.

“no” form no adsllineconfprofiletable adslatucchanconfinterleavemaxtr
The “no” form of this command sets the maximum interleaved channel rate (downstream) back to its default value of 32,736,000.

Defaults bps = 32,736,000

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucchanconfinterleavemaxtr 16000000
```

Related Commands adslconfprofileexttable adslconfprofilelinetype {<linetype>} on page 6-14
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucchanconfinterleavemintxrate {<bps>}

Summary Sets the minimum transmit (downstream) rate for the interleaved channel in bits per second (bps).

Required Mode Interface Config

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ADSL Line
Configuration
Profile Table
Commands

User Entered Parameters	<bps> An integer value, indicating the minimum transmit (downstream) rate for the interleaved channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for downstream transmission on the interleaved channel, with 1,000,000 equal to 1 Mbps.
Description	This command sets the minimum transmit rate for the fast channel in the downstream direction (from the BAS to the ADSL CPE). This value only applies if the ADSL Line Type has been set to a mode with the interleaved channel present.
“no” form	no adslprofiletable adslatucchanconfinterleavemintr The “no” form of this command sets the minimum interleaved channel rate (downstream) back to its default value of 32,000 (approximately 0.03 Mbps).
Defaults	bps = 32,000
Example	

```
BASR(config-if)# adslprofiletable adslatucchanconfinterleavemintr 1000000
```

Related Commands adslprofiletable adslprofilelinetype {<linetype>} on page 6-14
show interface adsl {<port>} adslprofiletable on page 6-73

```
adslprofiletable adslatucchanconfmaxinterleavedelay {<milliseconds>}
```

Summary Sets the maximum delay for the interleaved channel.

Required Mode Interface Config

User Entered Parameters **<milliseconds>**
The number of milliseconds (1/1000 second) maximum delay to use for the interleaved channel.

Description This command sets the maximum interleave delay for this channel. This command applies only to the interleaved channel and defines the mapping (relative spacing) between subsequent input bytes at the interleaver input and their placement in the bit stream at the interleaver output. Larger numbers provide greater separation between consecutive input bytes in the output bit stream allowing for improved impulse noise immunity at the expense of payload latency.

“no” form no adslprofiletable adslatucchanconfmaxinterleavedel
The “no” form of this command sets the interleaved delay back to its default value.

Defaults milliseconds = 16 for ADSL Annex A operation.

Example

```
BASR(config-if)# adslprofiletable adslatucchanconfmaxinterleavedelay 5
```

Related Commands show interface adsl {<port>} adslprofiletable on page 6-73

adsllineconfprofiletable adslatucconfadi2x

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ADSL Line
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CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adsllineconfprofiletable alctlusver



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adsllineconfprofiletable adslatucconfbitswap {enable | disable}

Summary Enables or disables downstream bit-swapping.

Required Mode Interface Config

User Entered Parameters {enable / disable}
Determines whether downstream bit-swapping is enabled or disabled.

Description This command enables or disables downstream bit-swapping on the BASR. Bit-swapping is used as a noise compensation feature on full-rate lines. With bit-swapping enabled, it automatically reduces the bits per tone in any channel affected by noise that is detected on the line. To use bit-swapping on a line, it must be enabled at both the CO device (BASR) and CPE on start-up. The CPE actually monitors line state, and initiates a bit-swapping request when appropriate.

“no” form no adsllineconfprofiletable adslatucconfbitswap
The “no” form of this command restores the default setting for downstream bit-swapping.

Defaults Enabled – For ADSL Annex A and ADSL2/2+.

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfbitswap enable
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adslprofileconfigtable adslatucabinetenable {enable | disable}

Summary Enables or disables handshake tones while in cabinet mode.



CAUTION: This command is only supported for ADSL2+ operation. In addition, this command only applies when the BAS is operating in cabinet mode.

Any setting of this value is ignored if the line is provisioned for any start-up mode other than ADSL2+.

Note that for the BAS ADSL port to successfully connect with the CPE, the CPE must also have this mode enabled.

Required Mode Interface Config

User Entered Parameters {enable / disable}

Determines whether handshake tones are enabled or disabled while in cabinet mode.

Description This command determines whether hand shake tones will be sent on the upper bins while in cabinet mode. In Cabinet Mode, the first 256 downstream bins of ADSL2+ lines are shut off and downstream transmission takes place only in the upper 256 bins of the ADSL2+ spectrum. See “Configuring ADSL Cabinet Mode” on page 6-148 for more information.

“no” form no adslprofileconfigtable adslatucabinetenable

The “no” form of this command restores the default setting for hand shake tone configuration.

Defaults Disabled

Example

```
BASR(config-if)# adslprofileconfigtable adslatucabinetenable enable
```

Related Commands show interface adsl {<port>} adslprofileconfigtable on page 6-73
configure interface adsl {<port> | <port-range> | all} cabinet-mode on page 6-149

adslprofileconfigtable adslatucodinggain {0db | 1db | 2db | 3db | 4db | 5db | 6db | 7db | auto}

Summary Specifies the coding gain level on the line used to reduce transmit power by using Trellis/RS coding techniques.

Required Mode Interface Config

User Entered Parameters {0 db – 7 db / auto}

The coding gain level on the line, specified in 1 dB increments from 0 dB to 7 dB, or specified as auto (recommended).

Description This command specifies the coding gain level on the line used to reduce transmit power via Trellis/RS (Reed-Solomon) coding techniques. This helps to determine the downstream connectivity rate with the CPE. In general, “auto” should be used, as this automatically allocates bits depending on line conditions. You can also manually select a coding gain from 0 dB to 7 dB, in 1 dB increments. A larger coding gain indicates a higher potential connection rate.

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ADSL Line Configuration Profile Table Commands

6.9

ADSL Line
Configuration
Profile Table
Commands

“no” form no adsllineconfprofiletable adslatucconfcodinggain
The “no” form of this command restores the coding gain level to the default of automatic.

Defaults auto

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfcodinggain 5db
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconfdataboost {enable | disable}

Summary Enables or disables a proprietary “data boost” feature that compresses the ATM header for faster throughput.



CAUTION: Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

The data boost feature should be *enabled* with the Pannaway PBG and RGN-410 ADSL products downstream. If you have one of these products, make sure to leave this feature enabled.

If you have a Pannaway RGN-210 or a CPE device from another vendor, this feature should in all likelihood be *disabled*. Contact Pannaway Technologies' Technical Assistance Center for more information if necessary.

Required Mode Interface Config

User Entered Parameters {*enable* / *disable*}

Activates or de-activates the proprietary “data boost” feature.

Description This command activates or de-activates a proprietary “data boost” mechanism that achieves faster throughput by compressing the ATM header in cells that transport data. By default, this feature is enabled in Pannaway’s CO and PBG-ADSL and RGN-410 ADSL devices. You may need to disable this feature if you are connecting to a non-Pannaway CPE device.

“no” form no adsllineconfprofiletable adslatucconfdataboost
The “no” form of this command restores the default state of data boost (enabled).

Defaults Enabled

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfdataboost disable
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucnfddatainterfacetype



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

6.9

ADSL Line Configuration Profile Table Commands

adsllineconfprofiletable adslatucnfdsbinusage [<bin>]

Summary Disables use of the specified bin for transmit data in the downstream direction, using either overlapped (Echo Cancellation) or non-overlapped (Frequency Division Multiplexing) mode.

Required Mode Interface Config

User Entered *<bin>*

Parameters

This optional parameter specifies a single bin number to disable; if no single bin is specified at the command line, all bins are disabled for downstream transmission.

Description

ADSL uses Discrete Multi-Tone (DMT) modulation that splits bandwidth usage into sub-channels for maximum data transfer. ADSL DMT modulation has 256 sub-channels, 32 of which are reserved for upstream data (although all 256 can be used for downstream data).

ADSL2+ operation doubles the maximum frequency used for downstream transmission (from 1.1 Mhz to 2.2 Mhz), so there are 512 sub-channels.

Each channel, or “bin”, is a division of frequency (4.3125 khz/bin) that has 15 available bits assigned to it.

This command lets you disable the use of the specified bin for transmitting data (bit-loading) in the downstream direction, whether Echo Cancellation or Frequency Division Multiplexing is set as the DMT Configuration Mode. This is useful on lines in which there is a known interference at the associated frequency of the downstream spectrum.

Enter this command as many times as necessary to disable bit-loading of the bins associated with the frequency at which interference is occurring. Only one bin can be specified per iteration of the command; perform the command multiple times to disable multiple bins.



NOTE: This parameter is supported only for ADSL Annex A, ADSL2 and ADSL2+ applications; it is not currently supported for G.Span/ADSL+ and G.Span Plus applications.

Note also that the “adslatucnfdseccustombins” must be enabled upon line start-up for the bin to be disabled.

“no” form

no adsllineconfprofiletable adslatucnfdsbinusage [<bin>]

The “no” form of this command re-enables the specified bin for bit-loading; if no individual bin is specified, all bins are re-enabled for bit-loading.

Defaults None.

Example

```
BASR(config-if)# adslprofiletable adslatucnfdsbinsage 410
BASR(config-if)# adslprofiletable adslatucnfdsbinsage 490
```

Related Commands adslprofiletable adslatucnfdsbinsage {enable | disable} on page 6-62

adslprofiletable adslatucnfdsbinsage



NOTE: This command is not operational.

adslprofiletable adslatucnfdsbinsage



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adslprofiletable adslatucnfdsbinsage



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adslprofiletable adslatucnfdsbinsage



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

6.9

ADSL Line Configuration Profile Table Commands

adsllineconfprofiletable adslatucnffrontenddesigntype



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

6.9

ADSL Line
Configuration
Profile Table
Commands

adsllineconfprofiletable adslatucnffullretrainenable {enable | disable}

Summary Enables or disables full retrain capability of the BASR.

Required Mode Interface Config

User Entered Parameters {enable / disable}

Enables or disables full retrain capability on the BASR.

Description If enabled, the BAS automatically monitors the following statistics and attempts a full retrain when the following conditions occur:

- One or more of the following failures have occurred for 2.25 seconds or more:

▸ local LOS failure	▸ remote LOS failure
▸ local SEF failure	▸ remote SEF failure
▸ local NCDI failure	▸ remote NCDI failure
▸ local NCDF failure	▸ remote NCDF failure
▸ local LCDI failure	▸ remote LCDI failure
▸ local LCDF failure	▸ remote LCDF failure
	▸ remote POW failure
- CRC error rate exceeds 40 per second for 10 consecutive seconds.

When a retrain occurs, an op state trap will be generated, indicating a change in the operational state of the transceiver.

In addition to enabling the Auto Full Retrain feature, you should perform a manual retrain (abort/start) for the following condition:

- CRC error rate exceeds the number of bytes per DMT symbol per minute for five consecutive minutes. This detects a slow deterioration in performance. At 8064 kbps this means detecting more than 252 CRC errors per minute for five consecutive minutes. At 256 kbps the threshold is 8 CRC errors per minute for five consecutive minutes.

"no" form no adsllineconfprofiletable adslatucnffullretrainenable

The "no" form of this command restores the default values for full-retrain enable.

Defaults Enabled – for Annex A and ADSL2/2+

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucnffullretrainenable enable
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucnfhwpwrreduction

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ADSL Line
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CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adsllineconfprofiletable adslatucnfinitiate {initiate_pn | wait_pn | c_tone}

Summary Determines whether the BAS or the downstream CPE initiates start-up. In T1.413 operational mode, it can also be used to send a “C-tone” to the remote CPE.

Required Mode Interface Config

User Entered Parameters *{initiate_pn | wait_pn | c_tone}*

The start-up initiation procedure, where:

- initiate_pn – the BAS transceiver initiates the activation tone (start-up signal).
- wait_pn – causes the BAS to listen for a start-up signal from the remote end (an activate request).
- c_tone – causes the BAS to transmit a C-tone (control tone) to the remote CPE. Upon detecting the C-tone, the CPE remains in a quiet period for 1 minute, after which it resumes sending activate requests.

Description This command determines whether the BAS or the downstream CPE initiates start-up. If “initiate_pn” is selected, the BAS transceiver sends activation tones to the CPE after power-up or loss of signal. If “wait_pn” is selected, the BAS waits for an activation request from the remote CPE. If “c_tone” is selected (in T1.413 mode only), the BAS sends control tones to the CPE, forcing it to remain in a quiet period for one minute.

“no” form no adsllineconfprofiletable adslatucnfinitiate
The “no” form of this command restores the default state of wait_pn (listening for a start-up signal from the remote CPE).

Defaults wait_pn

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucnfinitiate initiate_pn
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucnconfmaxbitsperbin {<rcv bits>}

Summary Specifies the maximum number of receive bits per bin.

Required Mode Interface Config

User Entered Parameters *<rcv bits>*

An integer value from 0-15, indicating the maximum number of receive bits per bin.

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Description ADSL uses Discrete Multi-Tone (DMT) modulation that splits bandwidth usage into sub-channels for maximum data transfer. ADSL DMT modulation has 256 sub-channels, 32 of which are reserved for upstream data (although all 256 can be used for downstream data).

ADSL2+ operation doubles the maximum frequency used for downstream transmission (from 1.1 Mhz to 2.2 Mhz), so there are 512 sub-channels.

Each channel, or “bin”, is a division of frequency (4.3125 khz/bin) that has 15 available bits assigned to it. This command lets you select the maximum number of receive bits per bin. Possible values can be less than or equal to the available 15 bits per bin.

“no” form no adsllineconfprofiletable adslatucconfmaxbitsperbin
The “no” form of this command restores the default of 15 receive bits per bin.

Defaults Receive bits per bin = 15

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfmaxbitsperbin 13
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconfmaxdco {128 | 256 | 511}

Summary Specifies the maximum number of Reed-Solomon (RS) codewords accumulated in BAS memory before transmission.

Required Mode Interface Config

User Entered Parameters {28 / 256 / 511}
128, 256, or 511 RS codewords.

Description This command specifies the maximum number of RS codewords accumulated in BAS memory before transmission (that is, the maximum interleaving depth supported by the downstream CPE hardware). Once this is set, the firmware will not allow this interleaving depth to be exceeded.

“no” form no adsllineconfprofiletable adslatucconfmaxdco
The “no” form of this command restores the default interleaving depth.

Defaults Maximum RS codewords = 511

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfmaxdco 128
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

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ADSL Line
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Commands

adsllineconfprofiletable adslatucconfmaxnompsdds {<tenth dBm/Hz>}

Summary Specifies the maximum nominal transmit PSD level in the downstream direction during initialization and showtime.



NOTE: This parameter is supported for ADSL2/ADSL2+ operation only.

Required Mode Interface Config

User Entered Parameters <tenth dBm/Hz>

The maximum nominal transmit PSD level, in steps of .1 dBm/Hz, with a range of -60 to -30 dBm/Hz (-600 to -300), with an offset value of +400. For example, for an actual value of -36 dBm/Hz, the setting would be $-360 + 400 = 40$.

Description This command specifies the maximum nominal transmit PSD (MAXNOMPSD) level in the downstream direction during initialization and showtime. Its value depends on CO MIB element settings and near end transmitter capabilities, and is exchanged in the G.994.1 Phase. The desired setting must include an offset value of +400.

The parameter can be different for the ATU-C (MAXNOMPSDds) and the ATU-R (MAXNOMPSDus).

“no” form no adsllineconfprofiletable adslatucconfmaxnompsdds
The “no” form of this command restores the default maximum nominal transmit PSD level.

Defaults Maximum nominal transmit PSD level = -400 (-40 dBm/Hz)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfmaxnompsdds 50
```

Related Commands adsllineconfprofiletable adslatucconfpsdmaskds {<bin>} {<mask_level>} on page 6-49
adsllineconfprofiletable adslaturconfmaxnompsdus {<tenth dBm/Hz>} on page 6-66
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconfmaxnomatpds {<tenth dBm>}

Summary Specifies the maximum nominal aggregate transmit power level in the downstream direction during initialization and showtime.



NOTE: This parameter is supported for ADSL2/ADSL2+ operation only.

Required Mode Interface Config

User Entered Parameters <tenth dBm>

The maximum nominal aggregate transmit power level, in steps of .1 dBm, with a range of 0 to 25.5 dBm (0 to 255), with an offset value of -204. For example, for an actual value of 20 dBm, the setting would be $200 + -204 = 6$.

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Description This command specifies the maximum nominal aggregate transmit power (MAXNOMATP) level in the downstream direction during initialization and showtime. The value depends on CO MIB element settings and local capabilities and is exchanged in the G.994.1 Phase. The parameter can be different for the ATU-C (MAXNOMATPds) and the ATU-R (MAXNOMATPus). The desired setting must include an offset value of -204.

“no” form no adsllineconfprofiletable adslatucconfmaxnomatpds
The “no” form of this command restores the default maximum nominal aggregate transmit power level.

Defaults Maximum nominal transmit PSD level = 204 (20.4 dBm)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfmaxnomatpds 14
```

Related Commands adsllineconfprofiletable adslatucconfpsdmaskds {<bin>} {<mask_level>} on page 6-49
adsllineconfprofiletable adslaturconfmaxnompsdus {<tenth dBm/Hz>} on page 6-66
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconfmaxsnrmgn {<tenth db>}

Summary Configures the maximum acceptable signal-to-noise margin.

Required Mode Interface Config

User Entered**Parameters**

<tenth db>
The maximum acceptable signal-to-noise margin, in 0.1 decibel increments, where the allowable range is 0-310 (310 is disabled) and the value must be set in increments of 10 (1 dB steps); for example, a setting of 10 = 1 dB, 20 = 2 dB, 30 = 3 dB.

Description This command configures the maximum acceptable Signal/Noise Margin. If the Noise Margin is above this, the modem should attempt to reduce its power output to optimize its operation.

Note that the interdependent SNR Margin values should be separated by at least 1 full dB in ADSL mode or 2 full dBs in ADSL 2/2+ mode; that is Min SNR margin < target SNR margin < max SNR margin (by at least 1 dB in ADSL mode, or 2 dBs in ADSL2/2+ mode).

“no” form no adsllineconfprofiletable adslatucconfmaxsnrmgn
The “no” form of this command disables the maximum signal-to-noise margin (sets the value to 310).

Defaults 310 (disabled)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfmaxsnrmgn 120
```

Related Commands adsllineconfprofiletable adslatucconfminsnrmgn {<tenth db>} on page 6-46
adsllineconfprofiletable adslatucconftargetsnrmgn {<tenth db>} on page 6-59
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adslprofiletable adslatucconfmindownshifttime

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NOTE: This command is not operational.

adslprofiletable adslatucconfmininp {inp0 | inp0_5 | inp1 | inp2 | inp_auto}



NOTE: This command is only supported for ADSL2/ADSL2+ operation. In addition, this command only applies when the BAS is operating in Seamless Rate Adaptation (SRA) mode, and if the line is set for interleaved channel mode.

Any setting of this value is ignored if the line is provisioned for fast-channel mode (it is always set to 0), or if it is provisioned for any start-up mode other than ADSL2/2+

Summary Specifies the Impulse Noise Protection (INP) for the downstream interleaved channel.**Required Mode** Interface Config**User Entered Parameters** {inp0 | inp0_5 | inp1 | inp2 | inp_auto}

The minimum impulse noise protection setting: 0, 0.5, 1, or 2 symbols, or automatic.

INP Auto calculates the achievable minimum INP for a given max rate and delay. This mode should be used if you want to give priority to rates and delay, and achieve the maximum possible INP for the given rate and delay.

Description This command specifies the minimum impulse noise protection for the downstream bearer channel. The impulse noise protection (INP) is expressed in symbols and can be set to the values 0, 1/2, 1, or 2 symbols, or automatic. For example, an INP value of 1 means that 1 symbol can be corrected; that is, a burst of noise for 1 symbol length/duration can be corrected without errors. One symbol equals 250 microseconds, so an INP of 1 correlates to a correction time of 250 microseconds.

For ADSL2/ADSL2+ the parameter for RS correction time is not used. Rather, users set the impulse noise protection.

According to G.992.3 and G.992.5, the minimum impulse noise and maximum delay constraints must be met in all cases. Therefore, the parameter settings of minimum impulse noise, maximum delay, and maximum downstream data rate directly affect each other; the user should set min INP and max delay such that the max downstream rate is achievable.



NOTE: According to the ADSL2/ADSL2plus standards, the minimum impulse noise must be met, therefore INP is given priority over data rates.

There is a trade-off between impulse noise protection, data rate, and delay. Higher impulse noise protection is achievable at a cost of lower rates and higher delay. Users must be careful when hard-coding the value of INP as system performance could be affected.

Amendment 2 to G.992.5 provides a table that specifies the downstream data rate limitations for various settings of Delay and INP. The BAS meets the standard-required INP for any given rate. The table below lists the required INP support for various downstream data rates. For example, setting INP minimum to 2 symbols and Delay to 8 ms will result in data rates of approximately 7 Mb/s or less. Conversely, limiting data rates to less than 7 Mb/s will yield higher actual values of INP.

Table 6-1. Impulse Noise Protection Setting

		Minimum Impulse Noise Protection Setting			
		0	0.5	1	2
Maximum Delay (MS)	1 (*)	24432	0	0	0
	2	24432	7104	3008	960
	4	24432	15232	7104	3008
	8	24432	22896	15232	7104
	16	24432	22896	15232	7552
	32	24432	22896	15232	7552
	63	24432	22896	15232	7552
(*) In G.997.1, a 1 ms delay is reserved to mean that Sp = 1 and Dp= 1.					

The proprietary Auto setting is not defined by G997.1. You have the option of using this feature to automatically manage impulse noise protection, based on requested data rate and delay. The Auto setting calculates the achievable minimum INP for a given max rate and delay. You should use this mode if you want to give priority to rates and delay, and achieve the maximum possible INP for the given rate and delay.



NOTE: The Auto setting gives data rates priority over INP.

The following table displays how Auto mode gives priority to the user-requested downstream data rate and delay, and then automatically sets Min Inp. If higher data rates and/or shorter delay are required, the tradeoff is lower impulse noise protection.

Table 6-2. Auto Mode Impulse Noise Protection

Maximum Downstream Data Rate	Minimum Impulse Noise Protection (INP) in Symbols			
	Delay $\geq 17 \mu\text{s}$	$16 \mu\text{s} \geq \text{Delay} \geq 9 \mu\text{s}$	$8 \mu\text{s} \geq \text{Delay} \geq 5 \mu\text{s}$	$4 \mu\text{s} \geq \text{Delay}$
7.584 Mb/s or less	2	1	0.5	0
Between 7.584 and 15.232 Mb/s	1	1	0.5	0
Between 15.232 and 22.880 Mb/s	0.5	0.5	0.5	0
Above 22.880 Mb/s	0	0	0	0

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“no” form no adsllineconfprofiletable adslatucconfmininp
The “no” form of this command restores the default setting of inp_auto.

Defaults inp_auto

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfntr local_osc
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconfminsrmgn {<tenth db>}

Summary Configures the minimum acceptable signal-to-noise margin.

Required Mode Interface Config

**User Entered
Parameters** <tenth db>

The minimum acceptable signal-to-noise margin in 0.1 decibel increments, where the allowable range is 0-310 (310 is disabled) and the value must be set in increments of 10 (1 dB steps); for example, a setting of 10 = 1 dB, 20 = 2 dB, 30 = 3 dB.

Description

This command configures the minimum acceptable Signal/Noise Margin. The SNR margin achieved is checked just prior to entering showtime. If the margin is less than the minimum acceptable noise margin, startup fails and is again attempted, with increased power output. The margin is not checked at run time.

The value of 310 disables minimum SNR margin checking. When this option is set to disabled, the firmware checks if the achieved margin is greater than the target SNR margin.

If start-up fails, you must decide if you can tolerate lower margin, and then set a lower value for minimum SNR margin or set target margin to a lower value (if minimum SNR margin is disabled).

Note that the interdependent SNR Margin values should be separated by at least 1 full dB in ADSL mode or 2 full dBs in ADSL 2/2+ mode; that is Min SNR margin < target SNR margin < max SNR margin (by at least 1 dB in ADSL mode, or 2 dB in ADSL2/2+ mode).

“no” form no adsllineconfprofiletable adslatucconfminsrmgn
The “no” form of this command disables the minimum signal-to-noise margin (sets the value to 310).

Defaults 310 (disabled)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfminsrmgn 120
```

Related Commands adsllineconfprofiletable adslatucconfmaxsnrmgn {<tenth db>} on page 6-43
adsllineconfprofiletable adslatucconftargetsrmgn {<tenth db>} on page 6-59
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

```
adslprofiletable adslatucnfmupshifttime
```



NOTE: This command is not operational.

```
adslprofiletable adslatucnfmupshifttime {all | eu32 | eu36 | eu40 | eu44 | eu48 | eu52 | eu56 | eu60 | eu64}
```

Summary Selects the Annex M Extended Upstream (EU) PSD mask compatibility.

Required Mode Interface Config

User Entered Parameters *{all | eu32 | eu36 | eu40 | eu44 | eu48 | eu52 | eu56 | eu60 | eu64}*

The Annex M Power Spectral Density mask type, where the PSD mask setting is as follows: EU-32 Spectral Compatibility, EU-36 Spectral Compatibility, EU-40 Spectral Compatibility, EU-44 Spectral Compatibility, EU-48 Spectral Compatibility, EU-52 Spectral Compatibility, EU-56 Spectral Compatibility, EU-60 Spectral Compatibility, EU-64 Spectral Compatibility, or all spectral compatibilities. These masks are described in the Annex M portion of ITU-T G.992.3 (ADSL2) and G.992.5 (ADSL2+).

Description This command sets the upstream Annex M Power Spectral Density (PSD) mask option to be applied to transmitted signals.

“no” form no adslprofiletable adslatucnfmupshiftmask

The “no” form of this command resets the extended upstream Annex M PSD mask to the default of EU60.

Defaults EU60

Example

```
BASR(config-if)# adslprofiletable adslatucnfmupshiftmask eu48
```

Related Commands show interface adsl {<port>} adslprofiletable on page 6-73

```
adslprofiletable adslatucnfmupshifttime
```



NOTE: This command is not operational.

```
adslprofiletable adslatucnfmupshifttime {local_osc | refck_8k}
```

Summary Specifies how Network Timing Recovery is performed by the transceiver.

Required Mode Interface Config

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Commands**User Entered Parameters** *{local_osc/refclk_8k}*

local_osc indicates that the network timing recovery is performed by the BAS's local oscillator (system clock); refclk_8k indicates that network timing recovery is performed by a reference clock on the network, using an 8 khz timing marker.



CAUTION: Local oscillator is currently the only network timing recovery supported by the BASR. Do not change this value to reflect a network reference clock.

Description This command specifies how Network Timing Recovery is performed by the transceiver. The options are local clock or reference clock; however, only the local clock option is supported by the BASR.

“no” form no adsllineconfprofiletable adslatuconfntr
The “no” form of this command restores the default network timing recovery method of local oscillator.

Defaults local_osc

Example

```
BASR(config-if)# adsllineconfprofiletable adslatuconfntr local_osc
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatuconfpowercutbackoffset {<hundredth db>}

Summary Defines the power offset added to transmit power cutback to all CPEs except for Alcatel CPEs.

Required Mode Interface Config

User Entered Parameters *<hundredth db>*

The power offset added in 0.01 decibel increments, where the allowable range is 0-1000 (0-10 dB).

Description This command configures the power offset added to transmit power cutback to all CPEs except Alcatel. This power cutback component helps CO to precisely determine the loop length.

“no” form no adsllineconfprofiletable adslatuconfpowercutbackoffset
The “no” form of this command restores the default setting of 1 dB.

Defaults 100 (1 dB)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatuconfpowercutbackoffset 200
```

Related Commands adsllineconfprofiletable adslatuconfpowercutbackoffsetalcatel {<hundredth db>} on page 6-49


```
adslprofileconfig powercutbackoffsetalcatel {<hundredth db>}
```

Summary Defines the power offset added to transmit power cutback to Alcatel CPEs.

Required Mode Interface Config

User Entered Parameters *<hundredth db>*

The power offset added in 0.01 decibel increments, where the allowable range is 0-1000 (0-10 dB).

Description This command configures the power offset added to transmit power cutback to Alcatel CPEs. This power cutback component helps CO to precisely determine the loop length.

“no” form no adslprofileconfig powercutbackoffsetalcatel
The “no” form of this command restores the default setting of 3 dB.

Defaults 300 (3 dB)

Example

```
BASR(config-if)# adslprofileconfig powercutbackoffsetalcatel 500
```

Related Commands adslprofileconfig powercutbackoffset {<hundredth db>} on page 6-48

```
adslprofileconfig psdmask {<bin>} {<mask_level>}
```

Summary Defines a custom PSD (Power Spectral Density) mask in the downstream direction.

Required Mode Interface Config

User Entered Parameters *<bin>*

The subcarrier index at which to apply the mask, in the range of 32 to 511. Note that bin 32 and bin 511 must be included in the mask definition.



CAUTION: There is no checking to ensure that the specified bin number is within the 32-511 range, and to ensure that bin 32 and 511 are included in the custom mask definition.

<mask_level>

A value from 0 to 190, representing the PSD mask level from 0 dBm/Hz (coded as 0) to -95 dBm/Hz (coded as 190), in steps of 0.5 dBm/Hz.

Description This command defines a custom Power Spectral Density (PSD) mask option to be applied to transmitted signals. This is the maximum power for each frequency that may be injected into the line at the customer end of the local loop.

The mask is defined in an array of breakpoint pairs, with a minimum of two breakpoints and a maximum of 32 breakpoints. Each breakpoint consists of a subcarrier index “t” and a PSD mask level (expressed in dBm/Hz) at that subcarrier. The set of breakpoints can then be represented as [(t1, PSD1), (t2, PSD2), ... , (tN, PSDN)].

Use the following guidelines for setting custom PSD mask breakpoints:

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- The following are the guidelines for setting custom PSD breakpoints:
- The sub-carrier indexes should be in the range of 32-511; this covers the passband of ADSL2+. The sub-carrier indexes should be monotonic, in increasing order, starting from 32 and ending at 511.

Note that for consistency, even for ADSL2 when only the lower 224 bins are used, the entire range from 32 to 511 is allowed to be specified.

- The PSD for bins 32 and 511 must be included for a minimum of two breakpoints; and a maximum of 32 total breakpoints can be defined.
- The PSD mask values should be in the range of 0 to 190 representing 0 dBm/Hz to -95 dBm/Hz.
- The largest PSD MUST be lower than the MAXNOMPSDDs. For instance, if MAXNOMPSDDs is -40 dBm/Hz represented by 0, the PSD CANNOT exceed -40 dBm/Hz represented by 80.
- The total power implied by the PSD mask should be equal or less than MAXNOMATPDs. For example, a PSD with a flat -40 dBm/Hz shape for the entire ADSL2+ passband requires ~23 dBm total power.

A sample set of breakpoints mask and other MIB parameter settings for a custom PSD mask are shown in the table and illustration below:

Table 6-3. Sample Custom PSD Mask Values

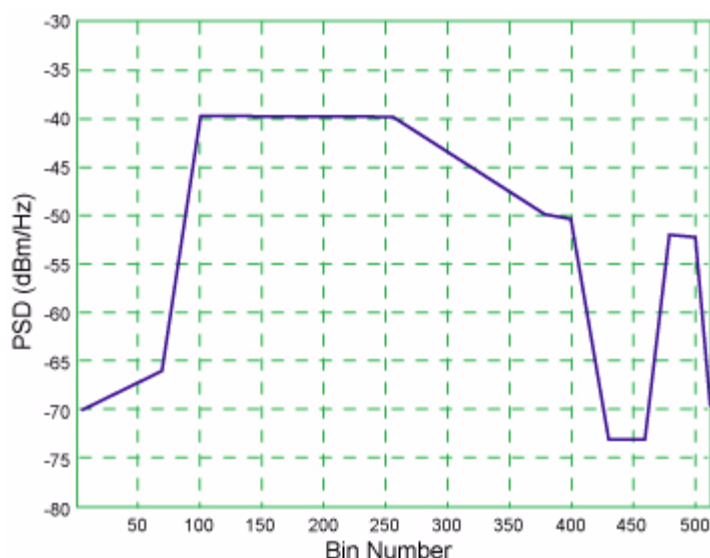
Bin index	PSD value	PSD (dBm/Hz)
32	140	-70
70	132	-66
100	80	-40
256	80	-40
376	100	-50
400	101	-50.5
430	146	-73
460	146	-73
480	104	-52
500	104	-52
511	140	-70

The following parameters were set as given below, for the sample PSD mask.

Table 6-4. ADSL Line Conf Profile Table Settings for Mask Usage

adslatucconfmaxnompssdds	0 (-40 dBm/Hz)
adslatucconfmaxnomatpds	204 (20.4 dBm)
adslatucconfpsdmaskdsenable	enable

The following diagram displays the expected PSD mask breakpoints given the above mask settings:



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“no” form `no adsllineconfprofiletable adslatuconfpsdmaskds [<bin> <mask_level>]`
 The no form of this command deletes one or all breakpoints specified in the custom PSD mask. If an optional bin and mask level are specified, only the selected breakpoint is deleted. If no bin and mask are specified, all breakpoints are deleted.

Defaults None

Example

```
BAS# config interface adsl 3 adsllineconfprofiletable adslatuconfpsdmaskds 32 170
BAS# config interface adsl 3 adsllineconfprofiletable adslatuconfpsdmaskds 35 180
BAS# config interface adsl 3 adsllineconfprofiletable adslatuconfpsdmaskds 511 170
```

Related Commands `adsllineconfprofiletable adslatuconfmaxnompsdds {<tenth dBm/Hz>}` on page 6-42
`adsllineconfprofiletable adslatuconfmaxnomatpds {<tenth dBm>}` on page 6-42
`adsllineconfprofiletable adslatuconfpsdmaskdsenable {enable | disable | enable_mod}` on page 6-51

`adsllineconfprofiletable adslatuconfpsdmaskdsenable {enable | disable | enable_mod}`

Summary Selects the PSD (Power Spectral Density) mask option in the downstream direction for ADSL2/ADSL2+ lines.

Required Mode Interface Config

User Entered Parameters `{enable | disable | enable_mod}`

The Power Spectral Density mask option, where the PSD mask setting is as follows:

- `enable` – Enable a custom PSD mask in the downstream direction. This mask is defined using the “`adsllineconfprofiletable adslatuconfmaxnomatpds {<tenth dBm>}`”, the “`adsllineconfprofiletable adslatuconfmaxnompsdds {<tenth dBm/Hz>}`”, and the “`adsllineconfprofiletable adslatuconfpsdmaskds {<bin> {<mask_level>}`” commands.
- `disable` – Enable the default Annex A PSD mask in the downstream direction.

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- **enable_mod** – Enable the mask on demand feature that allows the CO modem to optimize a transmit PSD mask during the start-up phase. This allows for boosted performance at medium or long ranges in READSL deployments.

Description This command sets the Power Spectral Density (PSD) mask option to be applied to transmitted signals. This is the maximum power for each frequency that may be injected into the line at the customer end of the local loop.

“no” form no adsl2lineconfprofiletable adsl2tuconfpsdmasktype
The “no” form of this command resets the PSD mask option to its default value of adsl2_nonovlp_flat.

Defaults adsl2_nonovlp_flat

Example

```
BASR(config-if)# adsl2lineconfprofiletable adsl2tuconfpsdmasktype cab
```

Related Commands adsl2lineconfprofiletable adsl2tuconfmaxnompsdds {<tenth dBm/Hz>} on page 6-42
adsl2lineconfprofiletable adsl2tuconfmaxnomatpds {<tenth dBm>} on page 6-42
adsl2lineconfprofiletable adsl2tuconfpsdmaskds {<bin>} {<mask_level>} on page 6-49

adsl2lineconfprofiletable adsl2tuconfpsdmasktype {msk2 | flat | cab | msk2_rfi | flat_rfi | cab_rfi}

Summary In RE_ADSL2 mode, sets the PSD (Power Spectral Density) mask option to be applied to transmitted signals.

Required Mode Interface Config

User Entered Parameters {msk2 | flat | cab | msk2_rfi | flat_rfi | cab_rfi}
The Power Spectral Density mask option, where the PSD mask setting is as follows:

- **flat** – Remove RE_ADSL2 mask support.

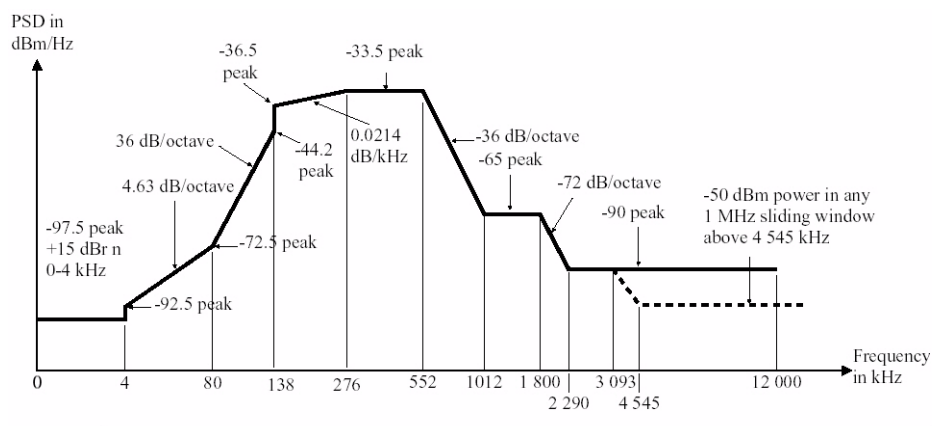


NOTE: The only option that currently applies is “flat”. The remaining options are not valid for RE_ADSL2 mode. The remaining PSD mask options for RE_ADSL2 mode are currently not configurable; the default option is adsl2_nonovlp_flat.

Description This command sets the Power Spectral Density (PSD) mask option to be applied to transmitted signals. This is the maximum power for each frequency that may be injected into the line at the customer end of the local loop.

- **flat** removes READSL2 mask support.
- The default mask (Non-Overlapped Downstream Mask Only) can be restored by using the “no” form of the command, listed below. This mask adheres to the mandatory downstream spectral mask for non-overlapped READSL2 operation as per G.992.3 Annex L (138 to 552 kHz passband). See the figure below.

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“no” form no adsl2lineconfprofiletable adsl2tuconfpsdmasktype

The “no” form of this command resets the PSD mask option to its default value of adsl2_nonovlp_flat.

Defaults adsl2_nonovlp_flat

Example

```
BASR(config-if)# adsl2lineconfprofiletable adsl2tuconfpsdmasktype cab
```

Related Commands adsl2lineconfprofiletable adsl2tuconfpowerattenuation {<power attenuation>} on page 6-60

adsl2lineconfprofiletable adsl2tuconfmode {fixed | adaptatstartup | adaptatruntime}

Summary Defines the type of rate adaptation in the downstream direction.

Required Mode Interface Config

User Entered Parameters {fixed / adaptatstartup / adaptatruntime}

The type of rate adaptation:

- fixed – Do not perform adaptation.
- adaptatstartup – Only perform rate adaptation on initialization.
- adaptatruntime – Perform rate adaptation at any time.



NOTE: This value only applies to ADSL2/ADSL2+.

Description This command sets the type of rate adaptation. You can select either:

- Fixed – No rate adaptation. Start up the line based upon configured maximum/minimum rates for the fast/interleaved channel.



NOTE: If this value is set to fixed, the maximum and minimum transmission rates must be set to the same value (for either the interleaved or fast channel, depending on which line type is provisioned).

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- Adapt at startup – Rate adapt between maximum and minimum rates upon initialization, based upon line condition.
- Adapt at runtime – Seamless rate adaptation (SRA), a feature of ADSL2, allows the ADSL transceiver to monitor line conditions and dynamically and seamlessly adapt its data rate (that is, without bit errors or retraining and causing service interruption). When SRA occurs, a downstream rate change trap is generated during runtime. You must ensure that the downstream ATM application also supports dynamic rate change. SRA can be enabled/disabled dynamically while the ADSL transceiver is in data mode. SRA is only supported in the downstream direction; upstream SRA is not supported. The receiver initiates SRA, therefore in the downstream direction the CPE is the master and enables SRA.

You can administratively set the conditions under which SRA is triggered by means of the `adslAturConfUpshiftSnrMgn`, `adslAturConfMinUpshiftTime`, `adslAturConfDownshiftSnrMgn`, and `adslAturConfMinDownshiftTime` parameters. See “Configuring ADSL2/2+ Downstream Seamless Rate Adaptation” on page 6-146 for more information about Seamless Rate Adaptation.

“no” form `no adslLineconfProfiletable adslAturConfRateMode`

The “no” form of this command restores the default setting of `adaptatruntime`.

Defaults `adaptatruntime`

Example

```
BASR(config-if)# adslLineconfProfiletable adslAturConfRateMode adaptatruntime
```

Related Commands

- `adslLineconfProfiletable adslAturChanConfFastMaxTxRate {<bps>}` on page 6-30
- `adslLineconfProfiletable adslAturChanConfFastMinTxRate {<bps>}` on page 6-31
- `adslLineconfProfiletable adslAturChanConfInterleavedMaxTxRate {<bps>}` on page 6-31
- `adslLineconfProfiletable adslAturChanConfInterleavedMinTxRate {<bps>}` on page 6-32
- `adslLineconfProfiletable adslAturConfDownshiftSnrMgn {<tenth db>}` on page 6-65
- `adslLineconfProfiletable adslAturConfMinUpshiftTime {<seconds>}` on page 6-70
- `adslLineconfProfiletable adslAturConfMinDownshiftTime {<seconds>}` on page 6-68
- `adslLineconfProfiletable adslAturConfUpshiftSnrMgn {<tenth db>}` on page 6-72
- `show interface adsl {<port>} adslLineconfProfiletable` on page 6-73

```
adslLineconfProfiletable adslAturConfFastOverheadDown {50% | 25% | 12% | 6% | 3% | 2% | 1% | disable_rs}
```

Summary Sets the percentage of overhead for the downstream fast channel (fast channel only – no interleaving, and one Reed-Solomon code word per DMT symbol), or disables the Reed-Solomon error correction.

Required Mode Interface Config

User Entered Parameters `{50% / 25% / 12% / 6% / 3% / 2% / 1% / disable_rs}`

The incremental percentage overhead setting for the fast channel, or disable Reed-Solomon error correction (`disable_rs`).

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Description This command sets the percentage overhead for the fast channel (based on the ratio of R/N where R is the number of redundancy bytes and N is the number of bytes in an Reed-Solomon frame) in the downstream direction. The percentage overhead can be programmed in multiple increments from 1 to 50 percent. This option can also be used to disable Reed-Solomon error correction.

“no” form no adsllineconfprofiletable adslatuconfrsfastovrhddown
The “no” form of this command restores the default of disabling Reed-Solomon error correction.

Defaults disable_rs

Example

```
BASR(config-if)# adsllineconfprofiletable adslatuconfrsfastovrhddown 3%
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

```
adsllineconfprofiletable adslatuconfrsfastovrhdup {50% | 25% | 12% | 6% | 3% | 2% | 1% |  
disable_rs}
```

Summary Sets the percentage of overhead for the upstream fast channel (fast channel only – no interleaving, and one Reed-Solomon code word per DMT symbol), or disables the Reed-Solomon error correction.

Required Mode Interface Config

User Entered Parameters {50% | 25% | 12% | 6% | 3% | 2% | 1% | disable_rs}

The incremental percentage overhead setting for the fast channel, or disable Reed-Solomon error correction (disable_rs).

Description This command sets the percentage overhead for the fast channel (based on the ratio of R/N where R is the number of redundancy bytes and N is the number of bytes in an Reed-Solomon frame) in the upstream direction. The percentage overhead can be programmed in multiple increments from 1 to 50 percent. This command can also be used to disable Reed-Solomon error correction.

“no” form no adsllineconfprofiletable adslatuconfrsfastovrhdup
The “no” form of this command restores the default of disabling Reed-Solomon error correction.

Defaults disable_rs

Example

```
BASR(config-if)# adsllineconfprofiletable adslatuconfrsfastovrhdup 1%
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

```
adsllineconfprofiletable adslatucnfrsintcorrectiondown {125us | 250us | 500us | 1ms | 2ms | 4ms | disable_rs}
```

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Summary Sets the Reed-Solomon correction time for the downstream interleaved channel, or disables the Reed-Solomon error correction.

Required Mode Interface Config

User Entered Parameters *{125us / 250us / 500us / 1ms / 2ms / 4ms / disable_rs}*
The specified Reed-Solomon correction time value for the interleaved channel, or disable Reed-Solomon error correction (disable_rs).

Description This command specifies the desired Reed-Solomon correction time (how large a burst of errors should be corrected) in the downstream direction. For values less than 500 μ s, correction time is not as meaningful due to the 250 μ s symbol duration. However, it is still a useful indication of the size of an impulse that can be corrected.

Interleaving is a technique that increases the modem's immunity to various line impairments. However, this comes at a cost of higher delay. When interleaved latency has been selected in the downstream direction, error correction is a function of correction time (C) and delay (d). By selecting Reed-Solomon (RS) correction time and delay, the transceiver can select all other RS parameters. The coefficients R (redundancy bytes) and D (interleaving byte depth) are automatically calculated.



NOTE: This parameter setting is ignored if the line is provisioned for ADSL2/2+ start-up mode. ADSL/ADSL2+ uses minimum impulse noise protection. See adsllineconfprofiletable adslatucnfrmininp {inp0 | inp0_5 | inp1 | inp2 | inp_auto} on page 6-44

"no" form no adsllineconfprofiletable adslatucnfrsintcorrectiondown
The "no" form of this command restores the default setting for Reed-Solomon error correction in the downstream direction.

Defaults The downstream default value is:

- 1ms – default for G.dmt and G.lite.

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucnfrsintcorrectiondown 2ms
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

```
adsllineconfprofiletable adslatucnfrsintcorrectionup {125us | 250us | 500us | 1ms | 2ms | 4ms | disable_rs}
```

Summary Sets the Reed-Solomon correction time for the upstream interleaved channel, or disables the Reed-Solomon error correction.

Required Mode Interface Config

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ADSL Line
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Commands**User Entered Parameters** *{125us / 250us / 500us / 1ms / 2ms / 4ms / disable_rs}*

The specified Reed-Solomon correction time value for the interleaved channel, or disable Reed-Solomon error correction (disable_rs).

Description This command specifies the desired Reed-Solomon correction time (how large a burst of errors should be corrected) in the upstream direction. For values less than 500 μ s, correction time is not as meaningful due to the 250 μ s symbol duration. However, it is still a useful indication of the size of an impulse that can be corrected.

Interleaving is a technique that increases the modem's immunity to various line impairments. However, this comes at a cost of higher delay. When interleaved latency has been selected in the upstream direction, error correction is a function of correction time (C) and delay (d). By selecting Reed-Solomon (RS) correction time and delay, the transceiver can select all other RS parameters. The coefficients R (redundancy bytes) and D (interleaving byte depth) are automatically calculated.



NOTE: This parameter setting is ignored if the line is provisioned for ADSL2/2+ start-up mode. ADSL/ADSL2+ uses minimum impulse noise protection. See `adsllineconfprofiletable adslatucconfininp {inp0 | inp0_5 | inp1 | inp2 | inp_auto}` on page 6-44

"no" form `no adsllineconfprofiletable adslatucconfrsintcorrectionup`

The "no" form of this command restores the default setting for Reed-Solomon error correction in the upstream direction.

Defaults 1ms (for G.dmt and G.lite)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfrsintcorrectionup 250us
```

Related Commands `show interface adsl {<port>} adsllineconfprofiletable` on page 6-73

```
adsllineconfprofiletable adslatucconfrxbadjust {enable | disable}
```

Summary Enables or disables automatic bin adjustment on the BASR.

Required Mode Interface Config

User Entered Parameters *{enable / disable}*

Disables or enables automatic bin adjustment.

Description This command enables or disables automatic bin adjustment on the BASR. If this is set to "disable", the receive start bin and receive end bin (as specified by the following two commands) are used.

"no" form `no adsllineconfprofiletable adslatucconfrxbadjust`

The "no" form of this command restores automatic bin adjustment to its default state of disabled.

Defaults Disable bin adjustment.

Example

```
BASR(config-if)# adslprofiletable adslatucnfrxbinadjust disable
```

Related Commands adslprofiletable adslatucnfrxstartbin {<start_bin>} on page 6-58
adslprofiletable adslatucnfrxendbin {<end_bin>} on page 6-58

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ADSL Line Configuration Profile Table Commands

```
adslprofiletable adslatucnfrxendbin {<end_bin>}
```

Summary Specifies the receive end bin number, for special configurations.

Required Mode Interface Config

User Entered Parameters **<end_bin>**
An integer value, from 6 to 64.

Description Use this command to select the highest bin number allowed for the receive (upstream) signal. Each channel, or “bin”, is a division of frequency (4.3125 khz/bin) that has 15 available bits assigned to it.



NOTE: The actual number of bits per bin is set by “adslprofiletable adslatucnfrxmaxbitsperbin {<rcv bits>}” on page 6-40.

“no” form no adslprofiletable adslatucnfrxendbin
The “no” form of this command restores the default receive end bin number of 64.

Defaults receive end bin = 64



NOTE: Although the default value is set to the maximum value of 64 for all operational modes, please note the following:

- For G.dmt, ANSI T.413, or ADSL2/ADSL2+ mode, 32 bins will actually be used in Annex A operation
- For ADSL2/ADSL2+ mode, all 64 bins are used in Annex M operation.

Example

```
BASR(config-if)# adslprofiletable adslatucnfrxendbin 13
```

Related Commands show interface adsl {<port>} adslprofiletable on page 6-73

```
adslprofiletable adslatucnfrxstartbin {<start_bin>}
```

Summary Specifies the receive start bin number, for special configurations.

Required Mode Interface Config

User Entered Parameters **<start_bin>**
An integer value, from 6 to 64.

Description Use this command to select the lowest bin number allowed for the receive (upstream) signal. Each channel, or “bin”, is a division of frequency (4.3125 khz/bin) that has 15 available bits assigned to it.



NOTE: The actual number of bits per bin is set by “adsllineconfprofiletable adslatucconfmaxbitsperbin {<rcv bits>}” on page 6-40.

“no” form no adsllineconfprofiletable adslatucconfrxstartbin
The “no” form of this command restores the default receive start bin number of 6.

Defaults receive start bin = 6

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfrxstartbin 2
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconftargetsnmgn {<tenth db>}

Summary Sets the target Signal/Noise Margin that the ADSL modem must achieve with a bit error rate (BER) of 10^{-7} or better to successfully complete initialization.

Required Mode Interface Config

User Entered <tenth db>

Parameters A Noise Margin value, expressed in tenths of decibels. The valid range is 0 (0 dB) to 310 (31 dB).

Description This command specifies the target Signal/Noise Margin that the ADSL modem must achieve with a bit error rate (BER) of 10^{-7} or better to successfully complete initialization. A BER of 10^{-7} is 1 errored bit per 10,000,000 bits received.

“no” form no adsllineconfprofiletable adslatucconftargetsnmgn
The “no” form of this command sets the target SNR back to its default value.

Defaults SNR Margin = 60 (6 dB)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconftargetsnmgn 55
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconftxendbin {<end_bin>}

Summary Specifies the transmit end bin number, for special configurations.

Required Mode Interface Config

User Entered {<end_bin>}

Parameters An integer value, from 6 to 1024.

Description Use this command to select the highest bin number allowed for the transmit (downstream) signal. Each channel, or “bin”, is a division of frequency (4.3125 khz/bin) that has 15 available bits assigned to it.

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ADSL Line Configuration Profile Table Commands

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“no” form no adslprofiletable adslatucnftxendbin
The “no” form of this command restores the default value of 1024.

Defaults Transmit end bin = 1024



NOTE: Although the default value is set to the maximum value of 1024 for all Annexes, please note the following:

- For Annex A and ADSL2, 256 bins will actually be used.
- For ADSL2+, 512 bins will actually be used.

Example

```
BASR(config-if)# adslprofiletable adslatucnftxendbin 14
```

Related Commands show interface adsl {<port>} adslprofiletable on page 6-73

adslprofiletable adslatucnftxpowerattenuation {<power attenuation>}

Summary Specifies transmit power attenuation on the line.

Required Mode Interface Config

User Entered Parameters {<power attenuation>}

The value of transmit power attenuation on the line, in decibels.

For G.dmt, the value may be from:

- 0db (zero decibels).
- 0.1db to 0.9db (tenths of a decibel increments from 0.1 decibels to 0.9 decibels).
- 1db to 12db (whole decibel increments from 1 to 12 decibels).

For ADSL2/2+, the value may be from:

- 0db (zero decibels)
- 1db to 40db (whole decibel increments from 1 to 40 decibels). Currently, values above 12db are not supported.

Description This command specifies the transmit power attenuation on the line.

“no” form no adslprofiletable adslatucnftxpowerattenuation
The “no” form restores the default transmit power attenuation value of 0db.

Defaults transmit power attenuation = 0db

Example

```
BASR(config-if)# adslprofiletable adslatucnftxpowerattenuation 10db
```

Related Commands show interface adsl {<port>} adslprofiletable on page 6-73

adsllineconfprofiletable adslatucnftxstartbin {<start_bin>}

Summary Specifies the transmit start bin number, for special configurations.

Required Mode Interface Config

User Entered Parameters <start_bin>
An integer value, from 6 to 512.

Description Use this command to select the lowest bin number allowed for the transmit (downstream) signal. Each channel, or “bin”, is a division of frequency (4.3125 khz/bin) that has 15 available bits assigned to it.



NOTE: The actual number of bits per bin is set by “adsllineconfprofiletable adslatucnftxstartbin {<rcv bits>}” on page 6-40.

“no” form no adsllineconfprofiletable adslatucnftxstartbin
The “no” form of this command restores the default transmit start bin number, as described below.

Defaults start bin = 20 (default for Annex A and ADSL2/ADSL2+ modes)

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucnftxstartbin 3
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucnftxupshiftsnrmgn



NOTE: This command is not operational.

adsllineconfprofiletable adslatucnftxusbitswap {enable | disable}

Summary Enables or disables upstream bit-swapping.

Required Mode Interface Config

User Entered Parameters {enable | disable}
Determines whether upstream bit-swapping is enabled or disabled.

Description This command enables or disables upstream bit-swapping on the BASR. Bit-swapping is used as a noise compensation feature on full-rate lines. With bit-swapping enabled, it automatically reduces the bits per tone in any channel affected by noise that is detected on the line. To use bit-swapping on a line, it must be enabled at both the CO device (BASR) and CPE on start-up. The CPE actually monitors line state, and initiates a bit-swapping request when appropriate.

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“no” form no adsllineconfprofiletable adslatucconfusbitswap
The “no” form of this command restores the default setting for upstream bit-swapping.

Defaults Enabled

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfusbitswap enable
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslatucconfusecustombins {enable | disable}

Summary Enables or disables custom bin selection.

Required Mode Interface Config

User Entered Parameters {enable/disable}
Disables or enables custom bin selection.

Description This command enables or disables custom bin selection on the BASR. If this is set to “enable”, you can select the bins that you want to exclude from being used in the downstream direction (via the adsllineconfprofiletable adslatucconfdnbinusage command). If this is set to “disable”, you cannot exclude individual bins from being used in the downstream direction.



NOTE: This parameter is supported only for ADSL Annex A, ADSL2 and ADSL2+ applications.

“no” form no adsllineconfprofiletable adslatucconfusecustombins
The “no” form of this command restores custom bin selection to its default state of disabled.

Defaults Disable custom bin selection.

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucconfusecustombins disable
```

Related Commands adsllineconfprofiletable adslatucconfdsbinusage [<bin>] on page 6-37

ATU-R Commands The following commands apply to the upstream ATU-R line profile.

adsllineconfprofiletable adslaturchanconfmaxtxrate {<bps>}

Summary Sets the maximum receive (upstream) rate for the fast channel in bits per second (bps).

Required Mode Interface Config

User Entered Parameters *<bps>*
An integer value, indicating the maximum transmit (upstream) rate for the fast channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for upstream transmission on the fast channel, with 1,000,000 equal to 1 Mbps. For ADSL2+, the maximum allowable rate setting is 1,088,000 (approximately 1.09 Mbps).

Description This command sets the maximum transmit rate for the fast channel in the upstream direction (from the ADSL CPE to the BAS). This value applies only if the ADSL Line type has been set to fast channel.

“no” form no adslprofiletable adslaturchanconfmaxtxrate
The “no” form of this command sets the maximum fast channel rate (upstream) back to its default value of 1,024,000 (1.024 Mbps).

Defaults bps = 1,024,000

Example

```
BASR(config-if)# adslprofiletable adslaturchanconfmaxtxrate 1010000
```

Related Commands adslprofiletable adslprofilelinetype {<linetype>} on page 6-14
show interface adsl {<port>} adslprofiletable on page 6-73

adslprofiletable adslaturchanconfmintrate {<bps>}

Summary Sets the minimum transmit (upstream) rate for the fast channel in bits per second (bps).

Required Mode Interface Config

User Entered Parameters *<bps>*
An integer value, indicating the minimum receive (upstream) rate for the fast channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for upstream transmission on the fast channel, with 1,000,000 equal to 1 Mbps.

Description This command sets the minimum transmit rate for the fast channel in the upstream direction (from the ADSL CPE to the BAS). This value applies only if the ADSL Line type has been set to fast channel.

“no” form no adslprofiletable adslaturchanconfmintrate
The “no” form of this command sets the minimum fast channel rate (upstream) back to its default value of 32,000 (approximately 0.03 Mbps).

Defaults bps = 32,000

Example

```
BASR(config-if)# adslprofiletable adslaturchanconfmintrate 20000
```

Related Commands adslprofiletable adslprofilelinetype {<linetype>} on page 6-14
show interface adsl {<port>} adslprofiletable on page 6-73

6.9

ADSL Line
Configuration
Profile Table
Commands

adsllineconfprofiletable adslaturchanconfinterleavemaxtxrate {<bps>}

Summary Sets the maximum receive (upstream) rate for the interleaved channel in bits per second (bps).

Required Mode Interface Config

User Entered Parameters **<bps>**
An integer value, indicating the maximum transmit (upstream) rate for the interleaved channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for upstream transmission on the interleaved channel, with 1,000,000 equal to 1 Mbps.

Description This command sets the maximum transmit rate for the interleaved channel in the upstream direction (from the ADSL CPE to the BAS). This value applies only if the ADSL Line type has been set to interleaved channel.

“no” form no adsllineconfprofiletable adslaturchanconfinterleavemaxtxrate
The “no” form of this command sets the maximum interleaved channel rate (upstream) back to its default value of 1,536,000 (approximately 1.09 Mbps) for Annex A operation, or 1,088,000 for ADSL2/2+ operation.

Defaults bps = 1,536,000 (Annex A) or 1,088,000 (ADSL2/2+)

Example

```
BASR(config-if)# adsllineconfprofiletable adslaturchanconfinterleavemaxtxrate 1200000
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslaturchanconfinterleavemintxrate {<bps>}

Summary Sets the minimum transmit (upstream) rate for the interleaved channel in bits per second (bps).

Required Mode Interface Config

User Entered Parameters **<bps>**
An integer value, indicating the minimum receive (upstream) rate for the interleaved channel. This is a 32-bit value (allowable range 0 – 4,294,967,295); practical values are the desired bps rate for upstream transmission on the interleaved channel, with 1,000,000 equal to 1 Mbps.

Description This command sets the minimum transmit rate for the interleaved channel in the upstream direction (from the ADSL CPE to the BAS). This value applies only if the ADSL Line type has been set to fast channel.

“no” form no adsllineconfprofiletable adslatucchanconfinterleavemintxrate
The “no” form of this command sets the minimum interleaved channel rate (upstream) back to its default value of 32,000 (approximately 0.03 Mbps).

Defaults bps = 32,000

Example

```
BASR(config-if)# adslslineconfprofiletable adslaturchanconfinterleavemintxrate 100000
```

Related Commands show interface adsl {<port>} adslslineconfprofiletable on page 6-73

```
adslslineconfprofiletable adslaturchanconfinterleavedelay {<max delay>}
```

Summary Sets the maximum delay for the interleaved channel.

Required Mode Interface Config

User Entered Parameters <max delay>

The number of milliseconds (1/1000 second) maximum delay to use for the interleaved channel.

Description This command sets the maximum interleave delay for this channel. This command applies only to the interleaved channel and defines the mapping (relative spacing) between subsequent input bytes at the interleaver input and their placement in the bit stream at the interleaver output. Larger numbers provide greater separation between consecutive input bytes in the output bit stream allowing for improved impulse noise immunity at the expense of payload latency.

“no” form no adslslineconfprofiletable adslaturchanconfmaxinterleavedelay
The “no” form of this command sets the interleaved delay back to its default value.

Defaults 16 ms for ADSL2/ADSL2+

Example

```
BASR(config-if)# adslslineconfprofiletable adslaturchanconfmaxinterleavedelay 5
```

Related Commands show interface adsl {<port>} adslslineconfprofiletable on page 6-73

```
adslslineconfprofiletable adslaturconfdownshiftsnrmgn {<tenth db>}
```

Summary For ADSL2/ADSL2+ only, sets the falling downstream noise margin threshold that triggers Seamless Rate Adaptation (SRA). See “Configuring ADSL2/2+ Downstream Seamless Rate Adaptation” on page 6-146 for more information.

Required Mode Interface Config

User Entered Parameters <tenth db>

The noise margin expressed as an integer from 0 to 310, with each increment of 1 indicating a 0.1 dB step from 0 to 31 dB.

Description This command sets the downstream noise margin threshold that triggers the BAS CO equipment to start SRA with respect to the downstream CPE. If the downstream noise margin falls below the level specified by the Downstream Downshift Noise Margin, and stays below that specified level for more than the time specified by the Downstream Minimum Downshift Time, the ATU-R will attempt to decrease the downstream net data rate. The Downstream Downshift Noise Margin ranges from 0 to 31 dB with 0.1 dB steps.

6.9*ADSL Line
Configuration
Profile Table
Commands*

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“no” form no adsllineconfprofiletable adslaturconfdownshiftsnrmgn
The “no” form of this command sets the downshift noise margin threshold back to its default of 30 (3 dB).

Defaults 30 (3 dB)

Example

```
BASR(config)# interface adsl 5 adsllineconfprofiletable adslaturconfdownshiftsnrmgn 300
```

Related Commands adsllineconfprofiletable adslaturconfmode {fixed | adaptatstartup | adaptatruntime} on page 6-53
adsllineconfprofiletable adslaturconfmindownshifttime {<seconds>} on page 6-68

adsllineconfprofiletable adslaturconfmaxnompsdus {<tenth dBm/Hz>}

Summary Specifies the maximum nominal transmit PSD level in the upstream direction during initialization and showtime.



NOTE: This parameter is supported for ADSL2/ADSL2+ operation only.

Required Mode Interface Config

User Entered Parameters <tenth dBm/Hz>

The maximum nominal transmit PSD level, in steps of .1 dBm/Hz, with a range of -60 to -30 dBm/Hz (-600 to -300), with an offset value of +380. For example, for an actual value of -32 dBm/Hz, the setting would be -320 + 380 = 60.

Description This command specifies the maximum nominal transmit PSD (MAXNOMPSD) level during initialization and showtime. Its value depends on CO MIB element settings and near end transmitter capabilities, and is exchanged in the G.994.1 Phase. The desired setting must include an offset value of +380.

The parameter can be different for the ATU-C (MAXNOMPSDds) and the ATU-R (MAXNOMPSDus).

“no” form no adsllineconfprofiletable adslaturconfmaxnompsdus
The “no” form of this command restores the default maximum nominal transmit PSD level.

Defaults Maximum nominal transmit PSD level = -380 (-38 dBm/Hz)

Example

```
BASR(config-if)# adsllineconfprofiletable adslaturconfmaxnompsdus 40
```

Related Commands adsllineconfprofiletable adslaturconfmaxnompsdds {<tenth dBm/Hz>} on page 6-42
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslaturconfmaxnomatpus {<tenth dBm>}

Summary Specifies the maximum nominal aggregate transmit power level during initialization and showtime in the upstream direction.



NOTE: This parameter is supported for ADSL2/ADSL2+ operation only.

Required Mode Interface Config

User Entered Parameters <tenth dBm>

The maximum nominal aggregate transmit power level, in steps of .1 dBm, with a range of 0 to 25.5 dBm (0 to 255), with an offset value of -125. For example, for an actual value of 14 dBm, the setting would be 140 + -125 = 15.

Description This command specifies the maximum nominal aggregate transmit power (MAXNOMATP) level during initialization and showtime. The value depends on CO MIB element settings and local capabilities and is exchanged in the G.994.1 Phase. The parameter can be different for the ATU-C (MAXNOMATPds) and the ATU-R (MAXNOMATPus). The desired setting must include an offset value of -125.

“no” form no adsllineconfprofiletable adslaturconfmaxnomatpus
The “no” form of this command restores the default maximum nominal aggregate transmit power level.

Defaults Maximum nominal transmit PSD level = 125 (12.5 dBm)

Example

```
BASR(config-if)# adsllineconfprofiletable adslaturconfmaxnomatpus 20
```

Related Commands adsllineconfprofiletable adslaturconfmaxnomatpds {<tenth dBm>} on page 6-42
show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslaturconfmaxsnrmgn {<tenth db>}

Summary Configures the maximum acceptable signal-to-noise margin.

Required Mode Interface Config

User Entered Parameters <snr margin>

The maximum acceptable signal-to-noise margin, in 0.1 decibel increments, where the allowable range is 0-310 (310 is disabled).

Description This command configures the maximum acceptable Signal/Noise Margin. If the Noise Margin is above this, the modem should attempt to reduce its power output to optimize its operation.

“no” form no adsllineconfprofiletable adslaturconfmaxsnrmgn
The “no” form of this command disables the maximum signal-to-noise margin (sets the value to 310).

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ADSL Line
Configuration
Profile Table
Commands**Defaults** 310 (disabled)**Example**

```
BASR(config-if)# adsllineconfprofiletable adslaturconfmaxsnrmgn 120
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

```
adsllineconfprofiletable adslaturconfmindownshifttime {<seconds>}
```

Summary For ADSL2/ADSL2+ only, sets the interval used with the falling downstream noise margin threshold trigger for SRA. See “Configuring ADSL2/2+ Downstream Seamless Rate Adaptation” on page 6-146 for more information.

Required Mode Interface Config**User Entered Parameters** <seconds>

The interval of time for which the downstream noise margin must remain below threshold for the BAS to trigger SRA. The range is 0 (disabled) to 16,383 seconds.

Description This command sets the interval of time for which the downstream noise margin should stay below the Downstream Downshift Noise Margin before the ATU-R attempts to decrease the downstream net data rate.

“no” form no adsllineconfprofiletable adslaturconfmindownshifttime
The “no” form of this command sets the downshift time interval back to its default of 30 seconds.

Defaults 30 seconds**Example**

```
BASR(config)# interface adsl 5 adsllineconfprofiletable adslaturconfdownshiftsnrmgn 300
```

Related Commands adsllineconfprofiletable adslaturconfmatemode {fixed | adaptatstartup | adaptatruntime} on page 6-53
adsllineconfprofiletable adslaturconfdownshiftsnrmgn {<tenth db>} on page 6-65

```
adsllineconfprofiletable adslaturconfmininp {inp0 | inp0_5 | inp1 | inp2 | inp_auto}
```



NOTE: This command is only supported for ADSL2/ADSL2+ operation. In addition, this command only applies when the BAS is operating in Seamless Rate Adaptation (SRA) mode, and if the line is set for interleaved channel mode.

Any setting of this value is ignored if the line is provisioned for fast-channel mode, or if it is provisioned for any start-up mode other than ADSL2/2+

Summary Specifies the Impulse Noise Protection (INP) for the upstream interleaved channel.**Required Mode** Interface Config**User Entered Parameters** {inp0 | inp0_5 | inp1 | inp2 | inp_auto}

The minimum impulse noise protection setting: 0, 0.5, 1, 2, or automatic.

INP Auto calculates the achievable minimum INP for a given max rate and delay. This mode should be used if you want to give priority to rates and delay, and achieve the maximum possible INP for the given rate and delay.

Description This command specifies the minimum impulse noise protection for the upstream bearer channel. The impulse noise protection (INP) is expressed in symbols and can be set to the values 0, 1/2, 1, or 2 symbols, or automatic. For example, an INP value of 1 means that 1 symbol can be corrected; that is, a burst of noise for 1 symbol length/duration can be corrected without errors. One symbol equals 250 microseconds, so an INP of 1 correlates to a correction time of 250 microseconds.

For ADSL2/ADSL2+ the parameter for RS correction time is not used. Rather, users set the impulse noise protection.

According to G.992.3 and G.992.5, the minimum impulse noise and maximum delay constraints must be met in all cases. Therefore, the parameter settings of minimum impulse noise, maximum delay, and maximum upstream data rate directly affect each other; the user should set min INP and max delay such that the maximum upstream rate is achievable.



NOTE: According to the ADSL2/ADSL2plus standards, the minimum impulse noise must be met, therefore INP is given priority over data rates.

There is a trade-off between impulse noise protection, data rate, and delay. Higher impulse noise protection is achievable at a cost of lower rates and higher delay. Users must be careful when hard-coding the value of INP as system performance could be affected.

Amendment 2 to G.992.5 provides a table that specifies the upstream data rate limitations for various settings of Delay and INP. The BAS meets the standard-required INP for any given rate. The table below lists the required INP support for various downstream data rates. For example, setting INP minimum to 2 symbols and Delay to 8 ms will result in data rates of approximately 7 Mb/s or less. Conversely, limiting data rates to less than 7 Mb/s will yield higher actual values of INP.

Table 6-5. Impulse Noise Protection Setting

		Minimum Impulse Noise Protection Setting			
		0	0.5	1	2
Maximum Delay (MS)	1 (*)	24432	0	0	0
	2	24432	7104	3008	960
	4	24432	15232	7104	3008
	8	24432	22896	15232	7104
	16	24432	22896	15232	7552
	32	24432	22896	15232	7552
	63	24432	22896	15232	7552
(*) In G.997.1, a 1 ms delay is reserved to mean that Sp = 1 and Dp= 1.					

6.9

ADSL Line Configuration Profile Table Commands

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ADSL Line
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The proprietary Auto setting is not defined by G997.1. You have the option of using this feature to automatically manage impulse noise protection, based on requested data rate and delay. The Auto setting calculates the achievable minimum INP for a given max rate and delay. You should use this mode if you want to give priority to rates and delay, and achieve the maximum possible INP for the given rate and delay.



NOTE: The Auto setting gives data rates priority over INP.

The following table displays how Auto mode gives priority to the user-requested upstream data rate and delay, and then automatically sets Min Inp. If higher data rates and/or shorter delay are required, the tradeoff is lower impulse noise protection.

Table 6-6. Auto Mode Impulse Noise Protection

Maximum Upstream Data Rate (in Kbps)	Minimum Impulse Noise Protection (INP) in Symbols					
	Delay $\geq 17 \mu\text{s}$	$16 \mu\text{s} \geq \text{Delay} \geq 9 \mu\text{s}$	$8 \mu\text{s} \geq \text{Delay} \geq 5 \mu\text{s}$	$4 \mu\text{s} \geq \text{Delay} \geq 3 \mu\text{s}$	$2 \mu\text{s}$	$1 \mu\text{s}$
448 or less	2	2	2	2	2	0
Between 449 and 704	2	2	2	2	1	0
Between 705 and 832	2	2	2	1	1	0
Between 833 and 1472	1	1	1	1	1	0
Between 1473 and 1728	1	1	1	1	0.5	0
Between 1729 and 1792	1	1	1	0.5	0.5	0
Between 1793 and 3072	0.5	0.5	0.5	0.5	0.5	0
Between 3073 and 3264	0.5	0.5	0.5	0.5	0	0
Above 3265	0	0	0	0	0	0

“no” form no adsllineconfprofiletable adslatucnfmininp

The “no” form of this command restores the default setting of inp_auto.

Defaults inp_auto

Example

```
BASR(config-if)# adsllineconfprofiletable adslatucnfmininp inp2
```

Related Commands show interface adsl {<port>} adsllineconfprofiletable on page 6-73

adsllineconfprofiletable adslaturcnfminupshifttime {<seconds>}

Summary For ADSL2/ADSL2+ only, sets the interval used with the rising downstream noise margin threshold trigger for SRA. See “Configuring ADSL2/2+ Downstream Seamless Rate Adaptation” on page 6-146 for more information.

Required Mode Interface Config

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ADSL Line
Configuration
Profile Table
Commands**User Entered** **<seconds>****Parameters**

The interval of time, in seconds, for which the downstream noise margin must remain above threshold for the BAS to trigger SRA. The range is 0 (disabled) to 16,383 seconds.

Description

This command sets the interval of time for which the downstream noise margin should stay above the Downstream Upshift Noise Margin before the ATU-R attempts to increase the downstream net data rate.

no" form

no adsllineconfprofiletable adslaturconfminupshifttime

The “no” form of this command sets the downshift time interval back to its default of 30 seconds.

Defaults

30 seconds

Example

```
BASR(config)# interface adsl 5 adsllineconfprofiletable adslaturconfdownshiftsnrmgn 300
```

Related Commands

adsllineconfprofiletable adslaturconfmode {fixed | adaptatstartup | adaptatruntime} on page 6-53
adsllineconfprofiletable adslaturconfupshiftsnrmgn {<tenth db>} on page 6-72

```
adsllineconfprofiletable adslaturconftargetsnrmgn {<tenth db>}
```

Summary

Sets the target Signal/Noise Margin that the ADSL modem must achieve with a bit error rate (BER) of 10^{-7} or better to successfully complete initialization. Note that when the ADSL/ADSL2+ Seamless Rate Adaptation feature is used, the upshift and downshift noise margin thresholds should be calculated with respect to the Target SNR Margin setting. See “Configuring ADSL2/2+ Downstream Seamless Rate Adaptation” on page 6-146 for more information.

Required Mode

Interface Config

User Entered**Parameters**

<tenth db>

A Noise Margin value, expressed in tenths of decibels.

Description

This command specifies the target Signal/Noise Margin that the ADSL modem must achieve with a bit error rate (BER) of 10^{-7} or better to successfully complete initialization. A BER of 10^{-7} is 1 errored bit per 10,000,000 bits received.

“no” form

no adsllineconfprofiletable adslaturconftargetsnrmgn

The “no” form of this command sets the target SNR back to its default value.

Defaults

<tenth db> = 60 (6 dB).

Example

```
BASR(config-if)# adsllineconfprofiletable adslaturconftargetsnrmgn 55
```

Related Commands

show interface adsl {<port>} adsllineconfprofiletable on page 6-73
adsllineconfprofiletable adslaturconfdownshiftsnrmgn {<tenth db>} on page 6-65
adsllineconfprofiletable adslaturconfupshiftsnrmgn {<tenth db>} on page 6-72

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ADSL Line
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Commands

```
adsllineconfprofiletable adslaturconfupshiftsnrmgn {<tenth db>}
```

Summary For ADSL2/ADSL2+ only, sets the rising downstream noise margin threshold that triggers Seamless Rate Adaptation (SRA). See “Configuring ADSL2/2+ Downstream Seamless Rate Adaptation” on page 6-146 for more information.

Required Mode Interface Config

User Entered Parameters *<tenth db>*
The noise margin expressed as an integer from 0 to 310, with each increment of 1 indicating a 0.1 dB step from 0 to 31 dB.

Description This command sets the downstream noise margin threshold that triggers the BAS CO equipment to start SRA with respect to the downstream CPE. If the downstream noise margin rises above the level specified by the Downstream Upshift Noise Margin, and stays above that specified level for more than the time specified by the Downstream Minimum Upshift Time, the ATU-R will attempt to increase the downstream net data rate. The Downstream Upshift Noise Margin ranges from 0 to 31 dB with 0.1 dB steps.

“no” form no adsllineconfprofiletable adslaturconfupshiftsnrmgn
The “no” form of this command sets the downshift noise margin threshold back to its default of 90 (9 dB).

Defaults 90 (3 dB)

Example

```
BASR(config)# interface adsl 5 adsllineconfprofiletable adslaturconfupshiftsnrmgn 150
```

Related Commands adsllineconfprofiletable adslaturconfupshiftsnrmgn {fixed | adaptatstartup | adaptatruntime} on page 6-53
adsllineconfprofiletable adslaturconfmindownshifttime {<seconds>} on page 6-68

```
adsllineconfprofiletable adsllineconfproflerowstatus {active | outofservice}
```

Summary Sets the status of this line configuration profile to active or out of service (inactive).

Required Mode Interface Config

User Entered Parameters *{active / outofservice}*
Active indicates the start-up request for this line should use the currently configured profile, and outofservice indicates that the line should be taken out of service.

Description Sets the status of this line configuration profile to active or out of service (inactive). When the line is out of service, configuration changes can be made to the profile.

“no” form no adsllineconfprofiletable adsllineconfproflerowstatus
Sets the line configuration profile to out of service (the default value).

Defaults Out of service

Example

```
BASR(config-if)# adsl lineconfprofiletable adsl lineconfprofilerowstatus active
```

Related Commands show interface adsl {<port>} adsl lineconfprofiletable on page 6-73

```
adsl lineconfprofiletable adsl linedmtconf trellis {trellison | trellisoff}
```

Summary Enables or disables Trellis Coding on the line.

Required Mode Interface Config

User Entered Parameters {*trellison* / *trellisoff*}

The desired state of Trellis Coding on the line, where *trellison* indicates that the coding is enabled, and *trellisoff* indicates the coding is disabled.

Description This command enables or disables Trellis Coding on the line. Trellis Coding is a form of error correction that allows for forward error correcting to account for bit errors from various interference on the line, such as crosstalk and background noise.



TIP: Since Trellis Coding significantly improves line performance, we recommend that you keep it enabled.

Trellis Coding **MUST** be enabled if the line is configured for ADSL2/ADSL2+.

“no” form no adsl lineconfprofiletable adsl linedmtconf trellis
The “no” form of this command restores the default setting of Trellis Coding enabled.

Defaults trellison (Trellis Coding enabled)

Example

```
BASR(config-if)# adsl lineconfprofiletable adsl linedmtconf trellis trellison
```

Related Commands show interface adsl {<port>} adsl lineconfprofiletable on page 6-73

```
show interface adsl {<port>} adsl lineconfprofiletable
```

Summary Display the contents of the ADSL line configuration profile table.

Required Mode Global Config

User-Entered Parameters <port>

Selects the ADSL port for which to display the ADSL line configuration profile table.

Description This table provides a summary of the configuration and operational settings of the ADSL line. This includes the settings for some parameters that are supported by ADSL2/2+ operation.

6.9

ADSL Line Configuration Profile Table Commands

Example

```

BASR# show interface adsl 17 adsl1lineconfprofiletable
Port 17
adsl1lineconfprofiletable:
adslAtucConfRateMode:          adaptAtStartup
adslAtucConfTargetSnrMgn:      60
adslAtucConfMaxSnrMgn:        310
adslAtucConfMinSnrMgn:        0
adslAtucConfDownshiftSnrMgn:  30
adslAtucConfUpshiftSnrMgn:    90
adslAtucConfMinUpshiftTime:    0
adslAtucConfMinDownshiftTime: 0
adslAtucChanConfFastMinTxRate: 32000
adslAtucChanConfInterleaveMinTxRate: 32000
adslAtucChanConfFastMaxTxRate: 32736000
adslAtucChanConfInterleaveMaxTxRate: 32736000
adslAtucChanConfMaxInterleaveDelay: 63
adslAturConfTargetSnrMgn:      60
adslAturConfMaxSnrMgn:        310
adslAturConfMinSnrMgn:        0
adslAturConfDownshiftSnrMgn:  30
adslAturConfUpshiftSnrMgn:    90
adslAturConfMinUpshiftTime:    30
adslAturConfMinDownshiftTime: 30
adslAturChanConfFastMinTxRate: 32000
adslAturChanConfInterleaveMinTxRate: 32000
adslAturChanConfFastMaxTxRate: 1536000
adslAturChanConfInterleaveMaxTxRate: 1536000
adslAturChanConfMaxInterleaveDelay: 16
adslLineConfProfileRowStatus:  active
adslLineDMTConfTrellis:      trellis0n
adslAtucConfDataInterfaceType: ext_ul2_tx_16_rx_16
adslAtucConfInitiate:        default_initiate
adslAtucConfMaxBitsPerBin:    15
adslAtucConfTxStartBin:       6
adslAtucConfTxEndBin:         511
adslAtucConfDrStby:           disable
adslAtucConfRxStartBin:       6
adslAtucConfRxEndBin:         31
adslAtucConfRxBinAdjust:      disable
adslAtucConfUseCustomBins:    disable
adslAtucConfDnBinUsage:       00: 0000 0000 0000 0000
                                08: 0000 0000 0000 0000
                                16: 0000 0000 0000 0000
                                24: 0000 0000 0000 0000
                                32: 0000 0000 0000 0000
                                40: 0000 0000 0000 0000
                                48: 0000 0000 0000 0000
                                56: 0000 0000 0000 0000
adslAtucConfTxPowerAttenuation: reduce_0db
adslAtucConfNtr:              local_osc
adslAtucConfCodingGain:       auto
adslAtucConfExpandedExchange: expanded
adslAtucConfBitSwap:          enable
adslAtucConfUsBitSwap:        disable
adslAtucConfRsFastOvrhdDown:  disable_rs
adslAtucConfRsIntCorrectionDown: 1ms
adslAtucConfRsFastOvrhdUp:    disable_rs
adslAtucConfRsIntCorrectionUp: 125us
adslAtucConfAdi2x:            std
adslAtucConfAlctlUsVer:       unknown
adslAtucConfMaxDCo:           511
adslAtucConfFullRetrainEnable: enable
adslAtucConfPsdMaskType:      adsl2_nonovlp_flat
adslAtucConfExtRsMemory:      noext
adslAtucConfHwPwrReduction:    disable
adslAtucConfDataBoost:        enable
adslAtucConfFrontEndDesignType: le_87213
adslAtucConfPMMMode:          l3_enable | l2_enable
adslAtucConfPML0Time:         180
adslAtucConfPML2Time:         60
adslAtucConfPML2ATPR:         3
adslAtucConfPML2MinRate:      1000000
adslAtucConfPML2EntryThresholdRate: 0
adslAtucConfPML2ExitThresholdRate: 512000
adslAtucConfPML2EntryRateMinTime: 1800
adslAtucConfMSGMINds:         16000
adslAturConfMSGMINus:         16000
adslAtucConfMinInp:           inp_auto
adslAturConfMinInp:           inp_auto
adslAtucConfCabinetHSEnable:  disable
adslAtucConfPowerCutBackOffset: 10
adslAtucConfPowerCutBackOffsetAlcatel: 30
adslAtucConfMAXNOMPSDds:      0
adslAturConfMAXNOMPSDus:      0
adslAtucConfMAXNOMATPds:      205
adslAturConfMAXNOMATPus:      125
adslAtucConfPSDMASKdsEnable:   disable
adslAtucConfPSDMASKds:        (uninitialized)
adslAtucConfCustomerID:       0
adslAtucConfMPsdMaskType:      eu60
adslAtucConfSeltLoopType:      real_cable
adslAtucConfSeltLoopGauge:

```

6.9**ADSL Line
Configuration
Profile Table
Commands**

Command Output: The following information is shown in the ADSL Configuration Profile table:

adslAtucConfRateMode	The type of rate adaptation in the downstream direction.
adslAtucConfTargetSnrMgn	Target Signal-to-Noise ratio margin that the ATU-C must observe in order to begin initialization of the channel.
adslAtucConfMaxSnrMgn	Maximum Signal-to-Noise ratio margin (in the upstream direction) allowable for a remote ADSL transceiver to maintain a connection to the BAS.
adslAtucConfMinSnrMgn	Not supported.
adslAtucConfDownshiftSnrMgn	Configured Signal/Noise Margin for rate downshift.
adslAtucConfUpshiftSnrMgn	Configured Signal/Noise Margin for rate upshift.
adslAtucConfMinUpshiftTime	Minimum time that the current margin is below UpshiftSnrMgn before a rate upshift occurs.
adslAtucConfMinDownshiftTime	Minimum time that the current margin is below DownshiftSnrMgn before a rate downshift occurs.
adslAtucChanConfFastMinTxRate	Minimum downstream transmission rate required for the operation of fast ATU-C channels.
adslAtucChanConfInterleaveMinTxRate	Minimum downstream transmission rate required for the creation of interleaved ATU-C channels.
adslAtucChanConfFastMaxTxRate	Maximum downstream transmission rate allowed for the operation of fast ATU-C channels.
adslAtucChanConfInterleaveMaxTxRate	Maximum limit of downstream transmission rate for interleaved ATU-C channels.
adslAtucChanConfMaxInterleaveDelay	Maximum interleaving delay for this ATU-C channel.
adslAturConfTargetSnrMgn	Target Signal-to-Noise ratio margin that a remote ADSL transceiver must attain in order to initialize with the BAS.
adslAturConfMaxSnrMgn	Value that will trigger a rate reduction (downshift) if ATU-R observed Signal-to-Noise ratio margin drops below this level.
adslAturConfMinSnrMgn	Not supported.
adslAturConfDownshiftSnrMgn	ADSL2/2+ only. Value at a rate increase (upshift) may occur if ATU-R observed Signal-to-Noise ratio margin exceeds this level.
adslAturConfUpshiftSnrMgn	ADSL2/2+ only. Minimum time that the ATU-R must observe a Signal-to-Noise ratio margin above the upshift margin value before an upshift operation is initiated.
adslAturConfMinUpshiftTime	ADSL2/2+ only. Minimum amount of time that an ADSL line must be above the applicable Signal-to-Noise ratio margin before the remote ADSL device begins the upshift operation.
adslAturConfMinDownshiftTime	ADSL2/2+ only. Minimum amount of time that an ADSL line must be below the applicable Signal-to-Noise ratio margin before the remote ADSL device begins the downshift operation.
adslAturChanConfFastMinTxRate	Minimum upstream transmission rate required for the operation of fast ATU-R channels.

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ADSL Line Configuration Profile Table Commands

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ADSL Line
Configuration
Profile Table
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adslAturChanConfInterleaveMinTxRate	Minimum upstream transmission rate required for the creation of interleaved ATU-R channels.
adslAturChanConfFastMaxTxRate	Maximum upstream transmission rate allowed for the operation of fast ATU-R channels.
adslAturChanConfInterleaveMaxTxRate	Maximum limit of upstream transmission rate for interleaved ATU-R channels.
adslAturChanConfMaxInterleaveDelay	Maximum interleaving delay for this ATU-R channel.
adslLineConfProfileRowStatus	Service status of the line configuration profile for the interface.
adslLineDMTConfTrellis	Status of Trellis encoding for the line.
adslAtucConfDataInterfaceType	Data framing type being used on the line.
adslAtucConfInitiate	ADSL line start-up initiation setting for BAS with respect to downstream ATU-R.
adslAtucConfMaxBitsPerBin	Maximum number of bits allowed per receiver bin.
adslAtucConfTxStartBin	Lowest bin number allowed for transmission.
adslAtucConfTxEndBin	Highest bin number allowed for transmission operation.
adslAtucConfDrStby	Configured state of the line driver power standby capability of the BAS.
adslAtucConfRxStartBin	Lowest bin number allowed for receive operation.
adslAtucConfRxEndBin	Highest bin number allowed for receive operation.
adslAtucConfRxBinAdjust	Configuration state of BAS receive bin adjustment capability.
adslAtucConfUseCustomBins	Configuration state of BAS custom bin capability.
adslAtucConfDnBinUsage	Indicates which bins are enabled for downstream transmission if custom bins is active. "0" in bit position indicates usage of the bin and a "1" indicates an unused bin, where the least significant bit position corresponds to bin 0 and most significant bit position corresponds to bin 511.
adslAtucConfTxPowerAttenuation	Specified transmit power attenuation (in dB).
adslAtucConfNtr	Setting for the distribution of a Network Timing Reference (NTR) signal through the BAS ADSL network.
adslAtucConfCodingGain	Coding gain administratively configured for the interface.
adslAtucConfExpandedExchange	EES configured value for T1.413 operation.
adslAtucConfBitSwap	Setting for downstream bit swapping operation on the line.
adslAtucConfUsBitSwap	Setting for the upstream bit swapping operation on the line.
adslAtucConfRsFastOvrhdDown	Percentage of the downstream Fast Buffer reserved for overhead.
adslAtucConfRsIntCorrectionDown	Configured correction time for the downstream interleave channel.
adslAtucConfRsFastOvrhdUp	Percentage of the upstream fast channel reserved for overhead.
adslAtucConfRsIntCorrectionUp	Correction time for the upstream interleave channel.

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ADSL Line
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adslAtucConfMaxDCo	Maximum supported interleaving depth.
adslAtucConfFullRetrainEnable	Configured setting for the automated full retraining of remote ADSL devices.
adslAtucConfPsdMaskType	Type of PSD mask currently in use on the BAS.
adslAtucConfExtRsMemory	External RS RAM utilization mode.
adslAtucConfHwPwrReduction	Not Applicable (test purposes only).
adslAtucConfDataBoost	Configuration state of the BAS Data Boost setting.
adslAtucConfFrontEndDesignType	Indicates the front end hardware reference design.
AdslAtucConfPMMODE	ADSL2/2+ only. Indicates power management mode state. This is currently not configurable, and is fixed at 0 (autonomous power management disabled).
adslAtucConfPML0Time	ADSL2/2+ only. The minimum time, in seconds, between an exit from the L2 (Low Power) state and a re-entry into the L2 state. This is currently not configurable and is fixed at 180 seconds.
adslAtucConfPML2Time	ADSL2/2+ only. In the link state L2, the ATU-C can control power trim. Power trimming is defined as a lowering of the reference transmit PSD level through a higher downstream power cutback level. adslAtucConfPML2Tim is the minimum time (in seconds) between an Entry into the L2 state and the first Power Trim in the L2 state and between two consecutive Power Trims in the L2 State. This is currently not configurable and is fixed at 180 seconds.
adslAtucConfPML2ATPR	ADSL2/2+ only. The maximum aggregate transmit power reduction (in dB) that can be performed through a single Power Trim in the L2 state. It ranges from 0 dB to 31 dB. This is currently not configurable and is fixed at the recommended value of 3 dB.
adslAtucConfPML2Rate	ADSL2/2+ only. The minimum net data rate for the bearer channel as desired by the operator of the system during the low power state (L2). The data rate is coded in bit/s, and can range from 256000 to 1024000. The minimum value should not be set lower than the bandwidth of the OAM channel. Currently, this is not configurable and is fixed at 65,536 bits.
adslAtucConfMSGMINds	ADSL2/2+ only. Configures the bandwidth of the downstream OAM channel. Note that this setting only ensures the minimum message rate is at least the set rate; it is not a fixed number. Currently, this is not configurable and is set at 4000 bps.
adslAturConfMSGMINus	ADSL2/2+ only. Configures the bandwidth of the upstream OAM channel. Note that this setting only ensures the minimum message rate is at least the set rate; it is not a fixed number. Currently, this is not configurable and is set at 4000 bps.
adslAtucConfMinInp	Configured minimum impulse noise protection for the downstream bearer channel.
adslAturConfMinInp	Configured minimum impulse noise protection for the upstream bearer channel.
adslAtucConfCabinetHSEnable	Cabinet mode enable/disable state.

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ADSL Line
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adslAtucConfPowerCutBackOffset	The power offset added to Tx power cutback to all CPE's except Alcatel.
adslAtucConfPowerCutBackOffset Alcatel	The power offset added to Tx power cutback in Alcatel CPEs.
adslAtucConfMAXNOMPSDs	Maximum nominal PSD for downstream.
adslAturConfMAXNOMPSDus	Maximum nominal PSD for upstream.
adslAtucConfMAXNOMATPds	Maximum nominal aggregate transmission power for downstream.
adslAturConfMAXNOMATPus:	Maximum nominal aggregate transmission power for upstream.
adslAtucConfPSDMASKdsEnable	Enable/disable state of custom PSD mask feature.
adslAtucConfPSDMASKds	Downstream PSD mask breakpoint pairs.
adslAtucConfCustomerID	N/A.
adslAtucConfMPsdMaskType	The Annex M upstream PSD mask type.
adslAtucConfSeltLoopType	The selected loop type for SELT tests: Real Cable, DLS90, or DLS400.
adslAtucConfSeltLoopGauge	The expected loop gauge for SELT Tests: 24AWG (0.5 mm) or 26AWG (0.4mm).

Related Commands

adsllineconfprofiletable adslatucconfratemode {fixed | adaptatstartup | adaptatruntime} on page 6-53

adsllineconfprofiletable adslatucconftargetsrmgn {<tenth db>} on page 6-59

adsllineconfprofiletable adslatucconfmaxsrmgn {<tenth db>} on page 6-43

adsllineconfprofiletable adslatucconfminsrmgn {<tenth db>} on page 6-46

adsllineconfprofiletable adslatucconfdownshiftsrmgn on page 6-38

adsllineconfprofiletable adslatucconfupshiftsrmgn on page 6-61

adsllineconfprofiletable adslatucconfminupshifttime on page 6-47

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adsllineconfprofiletable adslatucchanconfinterleavemaxtxrate {<bps>} on page 6-31

adsllineconfprofiletable adslatucchanconfmaxinterleavedelay {<milliseconds>} on page 6-33

adsllineconfprofiletable adslaturconftargetsrmgn {<tenth db>} on page 6-71

adsllineconfprofiletable adslaturconfmaxsrmgn {<tenth db>} on page 6-67

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adsllineconfprofiletable adslaturchanconfinterleavedelay {<max delay>} on page 6-65

adsllineconfprofiletable adsllineconfprofilerowstatus {active | outofservice} on page 6-72

adsllineconfprofiletable adslinedmtconfrellis {trellison | trellisoff} on page 6-73

adsllineconfprofiletable adslatucconfdatainterfacetype on page 6-37

adsllineconfprofiletable adslatucconfinitiate {initiate_pn | wait_pn | c_tone} on page 6-40

adsllineconfprofiletable adslatucconfmaxbitsperbin {<rcv bits>} on page 6-40

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adslprofiletable adslatucconfstartbin {<start_bin>} on page 6-61
 adslprofiletable adslatucconfendbin {<end_bin>} on page 6-59
 adslprofiletable adslatucconfstartby on page 6-38
 adslprofiletable adslatucconfstartbin {<start_bin>} on page 6-58
 adslprofiletable adslatucconfendbin {<end_bin>} on page 6-58
 adslprofiletable adslatucconfbinadjust {enable | disable} on page 6-57
 adslprofiletable adslatucconfusecustombins {enable | disable} on page 6-62
 adslprofiletable adslatucconfdsbinusage [<bin>] on page 6-37
 adslprofiletable adslatucconfpowerattenuation {<power attenuation>} on page 6-60
 adslprofiletable adslatucconfntr {local_osc | refck_8k} on page 6-47
 adslprofiletable adslatucconfcodinggain {0db | 1db | 2db | 3db | 4db | 5db | 6db | 7db | auto} on page 6-35
 adslprofiletable adslatucconfexpandedexchange on page 6-38
 adslprofiletable adslatucconfbitswap {enable | disable} on page 6-34
 adslprofiletable adslatucconfusbitswap {enable | disable} on page 6-61
 adslprofiletable adslatucconfsrstovrhddown {50% | 25% | 12% | 6% | 3% | 2% | 1% | disable_rs} on page 6-54
 adslprofiletable adslatucconfsrstovrhddown {125us | 250us | 500us | 1ms | 2ms | 4ms | disable_rs} on page 6-56
 adslprofiletable adslatucconfsrstovrhddup {50% | 25% | 12% | 6% | 3% | 2% | 1% | disable_rs} on page 6-55
 adslprofiletable adslatucconfsrstovrhddup {125us | 250us | 500us | 1ms | 2ms | 4ms | disable_rs} on page 6-56
 adslprofiletable adslatucconfmaxdco {128 | 256 | 511} on page 6-41
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 adslprofiletable adslatucconfextrsmemory on page 6-38
 adslprofiletable adslatucconfhwpwrreduction on page 6-40
 adslprofiletable adslatucconfdataboost {enable | disable} on page 6-36
 adslprofiletable adslatucconffrontenddesigntype on page 6-39
 adslprofiletable adslatucconfmininp {inp0 | inp0_5 | inp1 | inp2 | inp_auto} on page 6-44
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 adslprofiletable adslatucconfpsdmaskds {<bin>} {<mask_level>} on page 6-49
 adslprofiletable adslatucconfpsdmasktype {all | eu32 | eu36 | eu40 | eu44 | eu48 | eu52 | eu56 | eu60 | eu64} on page 6-47

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6.10 ADSL Line Table Commands

The following commands are used to set attributes that are common to both ends of the ADSL line. You can only configure entries in this table after you have set the ADSL line configuration for the current interface to “out of service” via the *adsllineconfprofiletable adsllineconfprofilerowstatus* command. Once you have set the ADSL line configuration to “out of service”, you can enter the commands in any order.

```
adsltable adslalarmconfprofile
```



NOTE: This command does not function for this release of the BAS.

```
adsltable adsllineconfaction {abort | startup | shutdown | analog_lb | atm_lb | digital_lb | c_reverb  
| c_medley | c_pilot | atuc_mtpr | atur_mtpr}
```

Summary Perform various actions on the selected ADSL line, including initiating diagnostic tests.



CAUTION: The diagnostic tests are intended to be run by Pannaway-certified technicians only.

Required Mode Interface Config

User Entered *abort*

Parameters Halts a diagnostic test in process, and puts the transceiver into idle mode.

startup

Starts-up the ADSL line, and puts the transceiver into data mode (after a successful start-up).

shutdown

Shuts down the ADSL line. This will completely shut off a selected DSP core (reducing power dissipation to the DSP) and the analog section including the line driver. This command should only be used if the port is never intended for subscriber service. The only way to restart the line is via an internal chip reset that must be performed by Pannaway-certified technicians. This command can not be performed on an active line. The line must be put into idle mode first (via the issuing of an abort action).

analog_lb

Performs an analog loopback test.

atm_lb

Performs an ATM loopback test.

digital_lb

Performs a digital loopback test.

c_reverb

Induces continual C-REVERB signal for testing purposes, allowing the ATU-R to adjust its AGC, recover and track timing, synchronize its receiver, and train its equalizer.

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ADSL Line
Table
Commands***c_medley***

Induces continual C-MEDLEY signal for testing purposes, allowing the ATU-R to train its frequency-domain equalizer and estimate downstream SNR during startup.

c_pilot

Induces continual C-PILOT signal for testing purposes, so that ATU-C and ATU-R can synchronize.

atuc_mpr

Initiates a MultiTone Power Ratio test at the ATU-C, so that non-linear distortion in the transmit path can be measured.

atur_mpr

Initiates a MultiTone Power Ratio test at the ATU-R, so that non-linear distortion in the transmit path can be measured.

Description This command performs various diagnostic tests on the line, or starts-up or shuts-down the line.

“no” Form None

Defaults None

Example

```
BASR(config-if)# adsltable adslconfaction startup
```

Related Commands show interface adsl {<port>} adsltable on page 6-83

adsltable adslconfclocktype



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adsltable adslconfprofile



NOTE: This command does not function for this release of the BAS.

adsltable adslconfutopia2rxaddr



CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adslinetable adsllineconfutopia12txaddr

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CAUTION: The operational setting controlled by this command is intended for Pannaway support and service testing. Do not make any configuration changes via this command. If this command is needed to resolve a service question, Pannaway Technologies' Technical Assistance Center will explain the applicability and use of the command. Incorrect use of this command could result in loss of communications between the Pannaway BAS and CPE devices.

adslinetable adsllinedeltconfldsf {inhibit | force}

Summary Determines whether the line should be forced into a loop diagnostics test mode (DELT test mode).

Required Mode Interface Config

User Entered Parameters *inhibit*

Inhibits the near-end ATU from performing loop diagnostics mode procedures on the line. Loop diagnostic mode procedures may still be initiated by the far end ATU.

force

Forces the near-end ATU to perform the loop diagnostics procedures.

Description In the event a port is not capable of reaching data (showtime) state, you typically activate line diagnostics procedures (from the BAS ATU-C) to troubleshoot the problem.



NOTE: The transition from a “training” state to DELT state may take several minutes. During DELT training, data is passed slowly to handle a very low Signal to Noise Ratio, which accounts for the fact that DELT can be utilized even for ports that are not capable of reaching showtime.

The Loop Diagnostic Mode Forced configuration parameter defines whether the line should be forced into the loop diagnostics mode by the ATU-C. The line must be in power management state L3 (Idle) state before it can be forced to loop diagnostics mode. The loop diagnostics data is available until the line is forced to the L0 state (Full On).

“no” Form None

Defaults None

Example

```
BASR(config-if)# adslinetable adsllinedeltconfldsf force
```

Related Commands

show interface adsl {<port>} adslinetable on page 6-83

```
adsltable adsltableconfpm {l0tol2 | l3force | l2tol0}
```

Summary Forces a change in the line's power management (PM) state.

Required Mode Interface Config

User Entered Parameters *l0tol2*

Forces the line to transition from full on (L0) state to low power (L2) state.

l3force

Forces the line to transition from full on (L0) state to idle (L3) state.

l2tol2

Forces the line to transition from low power (L2) state to full on (L0) state.

Description In order to force a change in the line state, you can set this configuration parameter for the BAS ATU-C. This parameter is set while in service; link state is set dynamically. This command is used to manually control power management, and will allow you to force a change in link state even if autonomous power management mode is enabled.



NOTE: Currently, the low power management state is not fully implemented. This command should only be used to force a port into idle state for DELT testing.

"no" Form None

Defaults None

Example

```
BASR(config-if)# adsltable adsltabledelconfldsf force
```

Related Commands `adsltable adsltabledelconfldsf {inhibit | force}` on page 6-82
`show interface adsl {<port>} adsltable` on page 6-83

```
show interface adsl {<port>} adsltable
```

Required Mode Interface Config

Summary Display a table of the ADSL port's line settings.

Required Mode Global Config

User-Entered Parameters *<port>*

The port for which to display the ADSL line table settings.

Description The ADSL line table that is shown provides information about the settings and operational configuration of both ends of the ADSL line specified. This information describes the coding, operational status, and configuration settings applied to the line through network management and by the manufactured characteristics of the BAS.

6.10

ADSL Line Table Commands

Example

```

BASR# show interface adsl 17 adslinetable
Port 17
adslinetable:
  adslLineCoding:          dmt
  adslLineType:            interleavedOnly
  adslLineDMTTrellis:     trellisOn
  adslLineConfAction:      startup
  adslLineConfUtopiaL2RxAddr: 19
  adslLineConfUtopiaL2TxAddr: 19
  adslLineConfClockType:   oscillator
  adslLineDMTConfEOC:      streaming
  adslLineDeltConfLDSF:    inhibit
  adslLinePMConfPMSF:

```

Command Output: The following information is shown in response to the command:

adslLineCoding	The line coding type being used on the ADSL interface. This field may show DMT (Discrete Multi Tone), CAP (Carrierless Amplitude and Phase Modulation), QAM (Quadrature Amplitude Modulation) or other, indicating a configuration out of these specifications.
adslLineType	The type of channel(s) that are allowed on the line. The line may allow no channels, fast channels only, interleaved channels only, or a combination of the two.
adslLineDMTTrellis	Status of Trellis encoding on the current interface.
adslLineConfAction	The most recent configuration action (startup, shutdown, abort) or test action (loopbacks, REVERB, MEDLEY, or PILOT signals, etc.) performed on the interface.
adslLineConfUtopiaL2RxAddr	The management-configurable Level 2 receive address used by the UTOPIA ADSL line controller.
adslLineConfUtopiaL2TxAddr	The management-configurable current Level 2 transmit address of the UTOPIA ADSL line controller.
adslLineConfClockType	The type of clock source (crystal or oscillator) currently used by the interface.
adslLineDeltConfLDSF	Indicates the configured setting for the line loop forced diagnostics mode by the ATU-C. Values are as follows: <ul style="list-style-type: none"> Inhibit – Inhibits the near-end ATU from performing loop diagnostics mode procedures on the line. Loop diagnostic mode procedures may still be initiated by the far-end ATU. This is the current setting (fixed in firmware). Force – Forces the near-end ATU to perform the loop diagnostics procedures. This setting is not currently available.
adslLinePMConfPMSF	Indicates the setting of manual power management control. This setting is currently not supported.

Related Commands adslinetable adsllineconfaction {abort | startup | shutdown | analog_lb | atm_lb | digital_lb | c_reverb | c_medley | c_pilot | atuc_mtpr | atur_mtpr} on page 6-80

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ADSL Line
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6.11 ADSL Port Profile Configuration and Initialization Commands

BAS 2.0 introduced a separation between a port configuration (via line “profiles”) and port initialization. A port can be pre-configured with a profile and then started up at a later time, or immediately started with a given profile or the default high-speed profile.

```
config interface adsl {<port> | <port-range> | all} start [<profile>]
```

Summary Initializes an ADSL port in the default mode, or using a specified profile (either previously configured for the profile, or specified as a run-time option).

Required Mode Interface Config or Global Config

User Entered Parameters *{<port> / <port-range> / all}*
If in Global Config mode, selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

!<profile>!

Including the profile as a run-time option starts the interface with one of the following pre-set profile values:

- **adsl** – Same as ITU-T G992.1 (G.dmt) standard compliance.
- **annex-a** – Same as ITU-T G992.1 (G.dmt) standard compliance.
- **annex-m** – Initializes in ADSL2+ with Annex M; if CPE does not support Annex M, no connection is made.
- **g_dmt** – ITU-T G992.1 (G.dmt) standard compliance.
- **g_lite** – ITU-T G.992.2 (G.lite) standard compliance, also known as splitterless ADSL.
- **ansi** – Full Rate ANSI T.413 (Issue 2) – Complying to the original ANSI (American National Standards Institute) for ADSL operation, allowing up to 8.192 Mbps downstream and 640 Kbps upstream.
- **adsl2** – ITU-T G.992.3 (G.dmt.bis) standard compliance for full-rate CPE (12 Mbps downstream and 1 Mbps upstream).
- **adsl2 annex-m** – ITU-T G.992.3 (G.dmt.bis) standard compliance for full-rate CPE, with double upstream bandwidth (12 Mbps downstream and 2 Mbps upstream).
- **adsl2_auto**: Initializes in ADSL2, unless not supported in which case it falls back to reach extended adsl2, g.dmt, then ansi (in that order) depending on the modes supported by the CPE.
- **adsl2_auto annex-m**: Initializes in ADSL2 with Annex M, unless not supported in which case it falls back to adsl2 (no annex M), reads12, g.dmt, and then ansi depending on the modes supported by the CPE.
- **adsl2plus** – ITU-T G.992.5 (bis plus) compliance for extended bandwidth ADSL2 (up to 26 Mbps downstream and 1 Mbps upstream).
- **adsl2plus annex-m** – ITU-T G.992.5 (bis plus) compliance for extended bandwidth ADSL2, with double upstream bandwidth (up to 26 Mbps downstream and 2 Mbps upstream).
- **adsl2plus_auto**: Initializes in ADSL2+, unless not supported in which case it falls back to adsl2, reach extended adsl2, g.dmt, then ansi depending on the modes supported by the CPE.

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ADSL Port Profile Configuration and Initialization Commands

6.11

ADSL Port Profile Configuration and Initialization Commands

- `adsl2plus_auto annex-m`: Initializes in ADSL2+ with Annex M, unless not supported in which case it falls back to `adsl2` with annex M, `adsl2plus` (no annex M), `adsl2` (no annex M), `readsl2`, `g.dmt`, and then `ansi` depending on the modes supported by the CPE.
- `readsl2` – ITU-T G.992.3 Annex L. Reach-extended ADSL2/ADSL2 Annex L (up to 20k feet; 6.1 km).
- `high-speed` – Same as `adsl2plus_auto`. This is the default option, restored by the “no” form of the command.
- `default` – Same as `adsl2plus_auto` and `high-speed`. This is the default option, restored by the “no” form of the command.

See Table 6-7 on page 87 of this chapter for more information.

- Description** This command initializes a single ADSL port, a range of ports, or all ports on the BAS.
- If no profile is specified and no profile has previously been assigned to a port, the ports are started-up in the default high-speed (`adsl2plus_auto`) mode.
 - If a port had previously been assigned a profile, via the “`config interface adsl {<port> | <port-range> | all} profile {<profile_type>}`” command, the port is started with that profile.
 - If a profile option is specified at the end of the “start” command, the ports are started-up in that mode.

When you run this command, several parameters in the `adsllineconfprofile` table are simultaneously set (depending on the default mode or selected profile), and then the BAS issues a “start-up” action on the line. See the table below for the `adsllineconfprofile` table settings that are configured when running the “start” command.

“no” form `no start`

The “no” form of this command takes the specified line out of service and puts it in idle state, leaving the start-up parameters configured for the last specified start-up mode.



NOTE: The “no” form of the command does not restore the default values associated with the “high-speed” mode. It takes the line out of service, leaving any start-up parameters set to the last specified start-up mode. For example, if you start-up a port in G.lite mode, running the “no start” command takes the line out of service but leaves it configured for G.lite operation.

Defaults `high-speed` (same as `adsl2plus_auto`)

Example

```
BASR(config-if)# start adsl2
```

Related Commands `show interface adsl {<port>} adsllineconfprofiletable` on page 6-73

`config interface adsl {<port> | <port-range> | all} profile {<profile_type>}`

Summary Assigns a pre-set profile to ADSL ports.

Required Mode Interface Config

User Entered Parameters `{<port> | <port-range> | all}`

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

<profile_type>

Assigns one of the following pre-set profile types to the port:

- default – Same as adsl2plus_auto. This is the default option, restored by the “no” form of the command.
- adsl – ITU-T G.992.1 (G.dmt) standard compliance.
- adsl2 – ITU-T G.992.3 (G.dmt.bis) standard compliance for full-rate CPE (12 Mbps downstream and 1 Mbps upstream).
- adsl2_auto: Initializes in ADSL2, unless not supported in which case it falls back to reach extended adsl2, adsl (g.dmt), then ansi (in that order) depending on the modes supported by the CPE.
- adsl2plus – ITU-T G.992.5 (bis plus) compliance for extended bandwidth ADSL2 (up to 26 Mbps downstream and 1 Mbps upstream).
- adsl2plus_auto: Initializes in ADSL2+, unless not supported in which case it falls back to adsl2, reach extended adsl2, adsl (g.dmt), then ansi (in that order) depending on the modes supported by the CPE.
- readsl2 – ITU-T G.992.3 Annex L. Reach-extended ADSL2/ADSL2 Annex L (up to 20k feet; 6.1 km).
- ansi – Full Rate ANSI T.413 (Issue 2) – Complying to the original ANSI specification for ADSL operation (8.192 Mbps downstream and 640 Kbps upstream).
- g_lite – ITU-T G.992.2 (G.lite) standard compliance, also known as splitterless ADSL.
- adsl2 annex m– ITU-T G.992.3 (G.dmt.bis) standard compliance for full-rate CPE, with double upstream bandwidth (12 Mbps downstream and 2 Mbps upstream).
- adsl2_auto annex-m: Initializes in ADSL2 with Annex M, unless not supported, in which case it falls back to adsl2 (non annex-m), reach extended adsl2, adsl (g.dmt), then ansi (in that order) depending on the modes supported by the CPE.
- adsl2plus annex-m – ITU-T G.992.5 (bis plus) compliance for extended bandwidth ADSL2, with double upstream bandwidth (up to 26 Mbps downstream and 2 Mbps upstream).
- adsl2plus_auto annex-m: Initializes in ADSL2+ with Annex M, unless not supported, in which case it falls back to adsl2+ (non annex-m), adsl2, reach extended adsl2, adsl (g.dmt), then ansi (in that order) depending on the modes supported by the CPE.

Description This command assigns a pre-set profile type to a single ADSL port, a range of ports, or all ports on the BAS. See the following table for the adsl2confprofile table settings that are configured in each profile.

Table 6-7. Profile Configuration

Profile Name		
	adslAtucConfTx PowerAttenuation	adslLineTrans AtucConfig
adsl (also g_dmt and annex_a)	0 dB	q9921PotsNonOverlapped
g_lite	0 dB	q9922 PotsNonOverlapped
ansi	0 dB	ansit1413

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ADSL Port Profile Configuration and Initialization Commands

Table 6-7. Profile Configuration

Profile Name		
	adslAtucConfTx PowerAttenuation	adslLineTrans AtucConfig
adsl2	reduce 0dB	q9923AnnexADSL2Pots NonOverlapped
adsl2 annex-m	reduce 0dB	q9923AnnexMPotsExtUs NonOverlapped
adsl2_auto	reduce 0dB	<ul style="list-style-type: none"> • q9923AnnexADSL2Pots NonOverlapped • q9923AnnexREADSL2 PotsNonOverlapped • q9921PotsNonOverlapped • ansit1413
adsl2_auto annex-m	reduce 0dB	<ul style="list-style-type: none"> • q9923AnnexMPotsExtUs NonOverlapped • q9923AnnexADSL2Pots NonOverlapped • q9923AnnexREADSL2 PotsNonOverlapped • q9921PotsNonOverlapped • ansit1413
adsl2plus	reduce 0dB	q9925AnnexADSL2Plus PotsOverlapped
adsl2plus annex-m	reduce 0dB	q9925AnnexMPotsExtUs NonOverlapped
adsl2plus_auto (also high-speed and default)	reduce 0dB	<ul style="list-style-type: none"> • q9925AnnexADSL2Plus PotsOverlapped • q9923AnnexADSL2Pots NonOverlapped • q9923AnnexREADSL2 PotsNonOverlapped • q9921PotsNonOverlapped • ansit1413
adsl2plus_auto annex-m		<ul style="list-style-type: none"> • q9925AnnexMPotsExtUs NonOverlapped • q9923AnnexMPotsExtUs NonOverlapped • q9925AnnexADSL2Plus PotsOverlapped • q9923AnnexADSL2Pots NonOverlapped • q9923AnnexREADSL2 PotsNonOverlapped • q9921PotsNonOverlapped • ansit1413
re_adsl2	reduce 0dB	q9923AnnexREADSL2 PotsNonOverlapped

“no” form no profile

The “no” form of this command restores the default high-speed profile to the specified port, range of ports, or all ports. Running the “no” command removes the previous profile from the startup and running config files and restores the default profile.

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ADSL Port Profile Configuration and Initialization Commands



NOTE: Any changes to the ADSL line do not take effect until the line is re-initialized (or the BAS is reset).

Defaults high-speed (same as adsl2plus_auto and default)

Example

```
BASR(config-if)# profile adsl2
```

Related Commands show interface adsl {<port> | adsl2plus_profiletable on page 6-73

```
show interface adsl {<port> | <port-range> | all} profile
```

Summary Displays the profiles assigned to the BAS ADSL ports.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters {<port> / <port-range> / all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

Description Displays the assigned profiles for the specified ADSL port.

Example

```
BASR(config)# show interface adsl 1-11 profile
Port  Description                               Profile
-----
01                                         default
02                                         default
03                                         default
04                                         adsl2plus
05                                         default
06                                         default
07                                         default
08                                         default
09                                         default
10                                         default
11                                         default
```

Related Commands config interface adsl {<port> | <port-range> | all} profile {<profile_type>} on page 6-86

6.11

*ADSL Port
Profile
Configuration
and
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6.11

ADSL Port Profile Configuration and Initialization Commands

```
show adsl-profile {<profile-name>} [annex-m]
```

Summary Displays the ADSL line settings associated with a specific profile.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters *<profile-name>*
The pre-defined identifier for each profile, as listed in **Table 6-7 on page 6-87**.

lannex-m
Adds the “annex-m” keyword to the profile name for Annex M operation.

Description Displays all ADSL line settings associated with a given profile, including the line type and data boost settings, and various settings for both downstream and upstream directions (maximum transmit rate, minimum rate alarm threshold, minimum transmit rate, maximum interleave delay, minimum impulse noise protection, maximum/minimum/target SNR margin) and downstream only settings (seamless rate adaptation setting, upshift/downshift SNR margin, and minimum upshift and downshift time).

Example

```
BAR# show adsl-profile adsl2plus_auto
Profile Name:      adsl2plus_auto (55)
Line Type:        interleavedOnly
Data Boost:       enable

Max Transmit Rate      DS:      32736000bps  US:      1536000bps
Min Rate Alarm Threshold DS:      0bps      US:      0bps
Min Transmit Rate      DS:      32000bps   US:      32000bps
Max Interleave Delay:   DS:      63ms     US:      16ms
Min INP                 DS:      inp_auto   US:      inp_auto
Max SNR Margin          DS:      31.0dB    US:      31.0dB
Target SNR Margin       DS:      6.0dB     US:      6.0dB
Min SNR Margin          DS:      0.0dB     US:      0.0dB
SRA                     DS:      adaptAtStartup
Upshift SNR Margin      DS:      9.0dB
Downshift SNR Margin    DS:      3.0dB
Min Upshift Time        DS:      30sec
Min Downshift Time      DS:      30sec
```

Related Commands config interface adsl {<port> | <port-range> | all} profile {<profile_type>} on page 6-86

```
show interface adsl {<port>} configuration
```

Summary Displays configuration information for a selected ADSL port.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters *<port>*
The interface for which to show configuration information.

Description This command displays summary information about an ADSL port. Most information is returned from the ADSL Line Configuration Profile Table, with some added information from the ADSL Line Configuration Profile Extension Table, the ADSL Line Table, and the ADSL Line Extension Table. The command also displays the current profile assigned to the port.

Example

```

BASR# show interface adsl 17 configuration
Port 17:

Line Configuration Profile: default

LineTransAtucConfig: 0x18800005 0x00000000 (adslLineExtTable)
ansit1413 |t1.413 |-----|---|
q9921PotsNonOverlapped |g.dmt |annex a |fdm|
q9923AnnexREADSL2PotsNonOverlapped |reads12 |annex adsl2 |fdm|
q9925AnnexADSL2PlusPotsOverlapped |adsl2+ |annex adsl2 |ec |
q9923AnnexADSL2PotsNonOverlapped |adsl2 |annex adsl2 |fdm|

ADSL Line Configuration (adslLineConfProfileTable):

AtucConfTargetSnrMgn: 60 AturConfTargetSnrMgn: 60
AtucConfMaxSnrMgn: 310 AturConfMaxSnrMgn: 310
AtucConfMinSnrMgn: 0 AturConfMinSnrMgn: 0
AtucConfDownshiftSnrMgn: 30 AturConfDownshiftSnrMgn: 30
AtucConfUpshiftSnrMgn: 90 AturConfUpshiftSnrMgn: 90
AtucConfMinUpshiftTime: 0 AturConfMinUpshiftTime: 30
AtucConfMinDownshiftTime: 0 AturConfMinDownshiftTime: 30
AtucConfFastMinTxRate: 32000 AturConfFastMinTxRate: 32000
AtucConfInterleaveMinTxRate: 32000 AturConfInterleaveMinTxRate: 32000
AtucConfFastMaxTxRate: 32736000 AturConfFastMaxTxRate: 15360000
AtucConfInterleaveMaxTxRate: 32736000 AturConfInterleaveMaxTxRate: 15360000
AtucConfMaxInterleaveDelay: 63 AturConfMaxInterleaveDelay: 16

LineConfProfileRowStatus: active
LineDMTConfTrellis: trellis0n
AtucConfDataInterfaceType: ext_ul2_tx_16_rx_16
AtucConfInitiate: default_initiate
AtucConfMaxBitsPerBin: 15
AtucConfTxStartBin: 6
AtucConfTxEndBin: 511
AtucConfDrStby: disable
AtucConfRxStartBin: 6
AtucConfRxEndBin: 31
AtucConfRxBinAdjust: disable
AtucConfTxPowerAttenuation: reduce_0db
AtucConfNtr: local_osc
AtucConfCodingGain: auto
AtucConfExpandedExchange: expanded
AtucConfBitSwap: enable
AtucConfUsBitSwap: disable
AtucConfRsFastOvrhdDown: disable_rs
AtucConfRsIntCorrectionDown: lms
AtucConfRsFastOvrhdUp: disable_rs
AtucConfRsIntCorrectionUp: 125us
AtucConfAdi2x: std
AtucConfAlctlUsVer: unknown
AtucConfMaxDco: 511
AtucConfFullRetrainEnable: enable
AtucConfPsdMaskType: adsl2_nonovlp_flat
AtucConfMPsdMaskType: eu60
AtucConfExtRsMemory: noext
AtucConfHwPwrReduction: disable
AtucConfDataBoost: enable
AtucConfFrontEndDesignType: le_87213
AtucConfRateMode: adaptAtStartup
AtucConfMinInp: inp_auto
AturConfMinInp: inp_auto
AtucConfPMMode: l3_enable | l2_enable
AtucConfPML0Time: 180
AtucConfPML2Time: 60
AtucConfPML2ATPR: 3
AtucConfPML2MinRate: 1000000
AtucConfMSGMINds: 16000
AturConfMSGMINus: 16000
AtucConfCabinethSEnable: disable
AtucConfPowerCutBackOffset: 10
AtucConfPowerCutBackOffsetAlcatel: 30
AtucConfMAXNOMPSDds: 0
AturConfMAXNOMPSDus: 0
AtucConfMAXNOMATPds: 205
AturConfMAXNOMATPus: 125
AtucConfPSDMASKdsEnable: disable
AtucConfPSDMASKds: (uninitialized)
AtucConfUseCustomBins: disable
AtucConfDnBinUsage: 00: 0000 0000 0000 0000
                        08: 0000 0000 0000 0000
                        16: 0000 0000 0000 0000
                        24: 0000 0000 0000 0000
                        32: 0000 0000 0000 0000
                        40: 0000 0000 0000 0000
                        48: 0000 0000 0000 0000
                        56: 0000 0000 0000 0000

ConfProfileLineType: interleavedOnly (adslConfProfileExtTable)
LineConfClockType: oscillator (adslLineTable)
LineDeltConfLDSF: inhibit (adslLineTable)
LinePMConfPMSF: (adslLineTable)

```

Note: see "show interface adsl <port> pm threshold" for alarm/PM thresholds.

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ADSL Port Profile Configuration and Initialization Commands

6.12

ATM
Configuration
and Monitoring
Commands

6.12 ATM Configuration and Monitoring Commands

The following commands are used to configure the VPI/VCI of the ADSL link between the BAS and the downstream CPE, and to monitor basic statistics for the ATM interface.

It is important to note that BAS firmware release 2.2.x supports multiple virtual channels per ADSL link, as well as VLAN association. *Chapter 11, “Segregating and Prioritizing Services on the BAS”* describes how to set up multiple VCs to segregate services (such as separate channels for voice, video, data, and management traffic), using service domains and VLANs.

However, if you intend to use a single VC with no segregated services, you can use the default channel settings (editing a single VPI/VCI if necessary) to create a single channel for ADSL service.

```
service-domain {<service-domain>} vpi-vci {<vpi>-<vci>}
```

Summary Configures the VPI/VCI value for an ATM connection over the ADSL link on one of six available channels (logical sub-interfaces).

Required Mode Interface Config

User Entered *<service-domain>*

Parameters

The selected virtual channel (or logical sub-interface), indexed 1–6. If you are configuring a single VC, it doesn’t matter which service domain channel index you specify.

<vpi>

The Virtual Path Identifier of the ATM connection on the service domain. The BAS supports a VPI range of 0 to 100.

<vci>

The Virtual Channel Identifier of the ATM connection on the service domain. The BAS supports a VCI range of 0 to 100.

Description This command configures the VPI/VCI value for the ATM PVC connection between the BAS and the downstream CPE on the specified service domain channel. The subscriber-side VPI/VCI value set at the downstream CPE (for example, the Pannaway PBG-ADSL or RGN) must match that set at the BAS for each service domain supported by the CPE.



CAUTION: The specified VPI/VCI must match that set at the downstream CPE, otherwise communications across the ADSL link will fail.

“no” form no service-domain <1-6> vpi-vci

The “no” form of this command restores the default VPI/VCI to the specified service domain.

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Configuration
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Commands

Defaults Service Domain 1: VPI = 0; VCI = 37
 Service Domain 2: VPI = 0; VCI = 36
 Service Domain 3: VPI = 0; VCI = 35
 Service Domain 4: VPI = 0; VCI = 38
 Service Domain 5: VPI = 0; VCI = 39
 Service Domain 6: VPI = 0; VCI = 40

Example

```
BASR(config-if)# service-domain 1 vpi-vci 0-50
```

Related Commands show interface stats atm {<port>} on page 6-93

```
clear stats adsl {<port-range> <service-domain-range>}
```

Summary Resets the statistics for the ATM interface associated with one or more ADSL ports.

Required Mode Privileged Exec

User Entered Parameters

<port-range>
 The range of ADSL ports for which to clear statistics. To specify an individual port, use the desired port index as the start and end of the range (for example, 3-3).

<service-domain-range>

The selected virtual channel range from N-N, where the value of N is an integer from 1-6. To specify an single service domain, use the desired index as both the start and end of the range (for example, 2-2).

Description Resets ADSL port ATM statistics counters to zero. These statistics can be displayed via the “show interface stats atm” command.

“no” form None

Defaults None

Example

```
BASR# clear stats adsl 13
```

Related Commands show interface stats atm {<port>} on page 6-93
 show interface stats atm {<port>} on page 11-18
 show service-domains {<port>} on page 11-18

```
show interface stats atm {<port>}
```

Summary Shows interface statistics, operational status (including the VPI/VCI and VLAN settings), and VLAN configuration for the ATM interface associated with an ADSL port.

Required Mode Privileged Exec

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ATM
Configuration
and Monitoring
Commands**User Entered
Parameters****<port>**
The interface for which to display statistics.**Description**

This command displays standard SNMP MIB-II interface statistics and information for the ATM interface associated with an ADSL port. All statistics are provided by 32-bit counters, are counted from 0 since the system was last initialized or since counters were last reset, and roll over at 4,294,967,295.

Example

```
BASR# show interface stats atm 17
```

```
Port 17, Service Domain 1:
```

```

PVID                : 1000
Egress Tagging       : Disabled
Rate Limit bps       : 25000000
IP MTU               : 1522
Shared BW bps        : 25000000
Admin state          : Up
Oper state           : Down
in unicast packets   : 1
in broadcast packets : 0
in multicast packets : 0
in bytes             : 96
out unicast packets  : 1
out broadcast packets : 0
out multicast packets : 43
out bytes            : 5352
interface vpi        : 0
interface vci         : 37
interface include vlan: 34

```

REMAINDER OF OUTPUT (SERVICE DOMAINS 2-6) CUT FOR EXAMPLE PURPOSES

Command Output The following information is displayed.

NOTE: The service domain and VLAN-specific output of this command is not described below. This output includes *PVID*, *Egress Tagging*, *Rate Limit bps*, and *interface include vlan*. This information is provided in Chapter 11, under a command description of this same command. See `show interface stats atm {<port>}` on page 11-18 and `show service-domains {<port>}` on page 11-18.

IP MTU	The IP Maximum Transmission Unit, or the size of the largest packet that can be sent or received on the interface. This is 1522 bytes (as the packets are sent from or received on Ethernet networks).
Shared BW bps	An estimate of the ADSL interface's available bandwidth in bits per second. This bandwidth is shared between all service domains (logical sub-interfaces) supported by the ADSL port.
Admin state	The current administrative state of the interface: up (operational), down (not initialized, or administratively disabled), or test (in some test state; no operational packets can be passed).

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ADSL
Monitoring
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Oper state	The current operational state of the interface: <i>up</i> if the interface is ready to receive and transmit network traffic; <i>down</i> if the interface is not initialized or is administratively disabled; <i>testing</i> if it is in a test state and no operational packets can be passed; <i>unknown</i> if the interface status can't be determined for some reason; or <i>notPresent</i> if the interface is missing components (typically hardware).
in unicast packets	Number of packets received by the interface that were not addressed to a multicast or broadcast address.
in broadcast packets	Number of packets received by the interface that were addressed to a broadcast address.
in multicast packets	Number of packets received by the interface that were addressed to a multicast address. For a MAC-layer protocol, this includes both Group and Functional multicast addresses.
out unicast packets	Number of packets transmitted by the interface that were not addressed to a multicast or broadcast address.
out broadcast packets	Number of packets requested for transmission by this interface that were addressed to a broadcast address, including those that were discarded or not sent.
out multicast packets	Number of packets requested for transmission by this interface that were addressed to a multicast address, including those that were discarded or not sent. For a MAC-layer protocol, this includes both Group and Functional multicast addresses.
interface vpi	The Transmit/Receive Virtual Path Identifier (VPI) used by the interface.
interface vci	The Transmit/Receive Virtual Channel Identifier (VCI) used by the interface.

Related Commands service-domain {<service-domain>} vpi-vci {<vpi>-<vci>} on page 6-92
clear stats adsl {<port-range> <service-domain-range>} on page 6-93
show interface stats atm {<port>} on page 11-18

6.13 ADSL Monitoring Commands

The following show and configure commands are used to display various ADSL statistics and status information.

```
show interface adsl {<port>} adslatucintervalextable
```

Summary Show the contents of the ADSL ATU-C interval extension table.

Required Mode Global Config

User-Entered Parameters *<port>*
The <port> parameter is the number of an ADSL port identifying a single ADSL line.

Description This command shows the contents of the BAS's Central Office side ADSL Transceiver Unit (ATU-C) extended interval information table. This table tracks the occurrence of certain events such as Errored Seconds and Unavailable Seconds conditions. These events are presented separately from the ATU-C Interval Information table because the events displayed in the table are not considered standard output for ADSL monitoring commands under RFC 2662; instead they are described in RFC 3440 (the extended line configuration profile table). The information shown in the table applies to the most recent 15 minute monitoring time interval for the ATU-R.

6.13

ADSL
Monitoring
Commands**Example**

```

BASR# show interface adsl 17 adslatucintervalextable
Port 17
adslatucintervalextable:
  adslAtucIntervalSesL:      0
  adslAtucIntervalUasL:      0
  adslAtucIntervalFecsL:     33

```

Command Output: The following information is shown on the displayed table:

adslAtucIntervalSesL	Count of seconds during which the selected interface experienced a Severely Errored Seconds condition.
adslAtucIntervalUasL	Number of seconds that the current interface experienced an Unavailable Errored Seconds condition.
adslAtucIntervalFecsL	Number of seconds that the current interface experienced a forward error correction anomaly (ADSL2/2+ only).

```
show interface adsl {<port>} adslatucintervaltable
```

Summary Show the error and operational status of the ATU-C during the last 15 minute period.

Required Mode Global Config

User-Entered *<port>*

Parameters The <port> parameter is the number of an ADSL port identifying a single ADSL line.

Description This command shows the contents of the BAS's Central Office side ADSL Transceiver Unit (ATU-C) interval information table. This table tracks the occurrence of several standards-defined error conditions that have been observed in the most recent 15 minute monitoring time interval for the ATU-C.

Example

```

BASR(config)# show interface adsl 17 adslatucintervaltable
Port 17
adslatucintervaltable:
  adslAtucIntervalNumber:      1
  adslAtucIntervalLoFs:        0
  adslAtucIntervalLoss:        0
  adslAtucIntervalLoIs:        0
  adslAtucIntervalLprs:        0
  adslAtucIntervalESs:         0
  adslAtucIntervalInits:       0
  adslAtucIntervalValidData:    1
  adslAtucIntervalInitsFailed:  0
  adslAtucIntervalTimeElapsed: 900

```


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Monitoring
Commands

Command Output: The following information is shown in the ATU-C interval table:

adslAtucIntervalNumber	The sequence number (from 1 to 96) of the 15 minute monitoring time interval that the displayed statistics are from. A value of 1 indicates the most recent complete monitoring interval, while a value of 96 indicates the interval completed 24 hours ago.
adslAtucIntervalLofs	Number of seconds in the displayed time interval during which a Loss of Framing condition was observed.
adslAtucIntervalLoss	Number of seconds in the time interval during which a Loss of Signal error occurred.
adslAtucIntervalLols	Count of the seconds that a Loss of Line condition was noted during the displayed time interval.
adslAtucIntervalLprs	Number of seconds that a Loss of Power condition occurred in the displayed time interval.
adslAtucIntervalESs	Number of one second intervals in the currently displayed 15 minute block containing one or more CRC anomalies or LOS/SEF defects.
adslAtucIntervalInits	Number of line initialization attempts during the time interval being examined.
adslAtucIntervalValidData	A marker showing if the data collected for the time interval can be considered fully valid. Data may be suspect if this field does not display 1.
adslAtucIntervalInitsFailed	Number of failed full-line initialization attempts during the current interval.
adslAtucIntervalTimeElapsed	The number of seconds that have elapsed in the currently displayed 15 minute time interval.

```
show interface adsl {<port>} adslatucperfdtaexttable
```

Summary Displays the ATU-C Performance Data Extension table statistics.

Required Mode Global Config

User-Entered *<port>*

Parameters The <port> parameter is the number of an ADSL port identifying a single ADSL line.

Description This command shows the contents of the BAS's Central Office side ADSL Transceiver Unit (ATU-C) Performance Data Extension table. This table keeps a count of transceiver physical line conditions and states. These entries are presented separately from the ATU-C Performance Data table because the events displayed in the table are not considered standard output for ADSL monitoring commands under RFC 2662; instead they are described in RFC 3440 (the extended line configuration profile table).

Example

```

BASR(config)# show interface adsl 17 adslatucperfdataexttable
Port 17
adslatucperfdataexttable:
  adslAtucPerfStatSesL:          0
  adslAtucPerfStatUasL:          0
  adslAtucPerfCurr15MinSesL:     0
  adslAtucPerfCurr15MinUasL:     0
  adslAtucPerfCurr1DaySesL:      0
  adslAtucPerfCurr1DayUasL:      0
  adslAtucPerfPrev1DaySesL:      0
  adslAtucPerfPrev1DayUasL:      0
  adslAtucPerfStatFecsL:         91
  adslAtucPerfStatLossL:         0
  adslAtucPerfCurr15MinFecsL:    33
  adslAtucPerfCurr1DayFecsL:     91
  adslAtucPerfPrev1DayFecsL:     0

```

Command Output: The following data is shown in the ADSL ATU-C Performance Data Extension table:

adslAtucPerfStatSesL	Number of Severely Errored Seconds noted on this line.
adslAtucPerfStatUasL	Number of Unavailable Errored Seconds conditions for the interface.
adslAtucPerfCurr15MinSesL	Number of Severely Errored Seconds conditions seen on this interface during the current 15 minute time interval.
adslAtucPerfCurr15MinUasL	Number of Unavailable Errored Seconds experienced during the current 15 minute time interval.
adslAtucPerfCurr1DaySesL	Number of Severely Errored Seconds conditions seen on this interface during the current 1 day time interval.
adslAtucPerfCurr1DayUasL	Number of Unavailable Errored Seconds experienced during the current 1 day time interval.
adslAtucPerfPrev1DaySesL	Number of Severely Errored Seconds conditions on this interface during the previous completed 1 day time interval.
adslAtucPerfPrev1DayUasL	Number of Unavailable Errored Seconds experienced during the previous completed 1 day time interval.
adslAtucPerfStatFecsL	Count of 1-second intervals with one or more forward error correction (FEC) anomalies the BAS was reset.
adslAtucPerfStatLossL	Count of 1-second intervals containing one or more loss of signal (LOS) defects.
adslAtucPerfCurr15MinFecsL	Count of 1-second intervals, in the current 15 minute interval, with one or more forward error correction (FEC) anomalies.
adslAtucPerfCurr1DayFecsL	Count of 1-second intervals, in the current 24 hour interval, with one or more forward error correction (FEC) anomalies.
adslAtucPerfPrev1DayFecsL	Count of 1-second intervals, within the most recent previous 1 day period, with one or more forward error correction (FEC) anomalies.

6.13

ADSL Monitoring Commands

```
show interface adsl {<port>} adslatucperfdatatable
```

Summary Show ATU-C performance information.

Required Mode Global Config

User-Entered Parameters *<port>*

The *<port>* parameter is the number of an ADSL port identifying a single ADSL line.

Description This command shows the contents of the BAS's Central Office side ADSL Transceiver Unit (ATU-C) Performance Data table. The table presents a set of collected performance and operation information for the selected ADSL port's ATU-C interface. This information includes Loss and Error conditions and interface operating time elapsed.

Example

```
BASR(config)# show interface adsl 17 adslatucperfdatatable
Port 17
adslatucperfdatatable:
adslAtucPerfLofs:                0
adslAtucPerfLoss:                0
adslAtucPerfLols:                0
adslAtucPerfLprs:                0
adslAtucPerfESs:                0
adslAtucPerfInits:               1
adslAtucPerfValidIntervals:      2
adslAtucPerfInvalidIntervals:    94
adslAtucPerfCurr15MinTimeElapsed: 816
adslAtucPerfCurr15MinLofs:       0
adslAtucPerfCurr15MinLoss:       0
adslAtucPerfCurr15MinLols:       0
adslAtucPerfCurr15MinLprs:       0
adslAtucPerfCurr15MinESs:        0
adslAtucPerfCurr15MinInits:      0
adslAtucPerfCurr1DayTimeElapsed: 2444
adslAtucPerfCurr1DayLofs:        0
adslAtucPerfCurr1DayLoss:        0
adslAtucPerfCurr1DayLols:        0
adslAtucPerfCurr1DayLprs:        0
adslAtucPerfCurr1DayESs:         0
adslAtucPerfCurr1DayInits:       1
adslAtucPerfPrev1DayMoniSecs:    0
adslAtucPerfPrev1DayLofs:       0
adslAtucPerfPrev1DayLoss:       0
adslAtucPerfPrev1DayLols:       0
adslAtucPerfPrev1DayLprs:       0
adslAtucPerfPrev1DayESs:        0
adslAtucPerfPrev1DayInits:      0
adslAtucPerfInitsFailed:         0
adslAtucPerfCurr15MinInitsFailed: 0
adslAtucPerfCurr1DayInitsFailed: 0
adslAtucPerfPrev1DayInitsFailed: 0
adslAtucPerfTimeElapsed:        2444
```

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ADSL Monitoring Commands

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ADSL
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Command Output: The following information is shown on in the ATU-C performance data table:

adslAtucPerfLofs	Number of Loss of Framing errors seen on the ATU-C interface since the last initialization.
adslAtucPerfLoss	Number of Loss of Signal errors observed on the ATU-C interface since the last initialization.
adslAtucPerfLols	Count of the Loss of Line conditions seen on the ATU-C interface since the last initialization or reset.
adslAtucPerfLprs	Number of Loss of Power errors seen on the interface since the last reset.
adslAtucPerfESS	Total number of Errored Seconds experienced by the interface since the last reset.
adslAtucPerfInits	Number of line initializations performed on the interface since the last initialization or reset.
adslAtucPerfValidIntervals	Number of previous 15 minute time intervals for which performance data was collected.
adslAtucPerfInvalidIntervals	Number of time intervals for which no performance data is available.
adslAtucPerfCurr15MinTimeElapsed	Count of seconds that have elapsed in the current 15 minute time interval.
adslAtucPerfCurr15MinLofs	Number of Loss of Framing errors seen on the interface during the current 15 minute performance data collection interval.
adslAtucPerfCurr15MinLoss	Number of Loss of Signal errors observed on the interface during the current 15 minute performance data collection interval.
adslAtucPerfCurr15MinLols	Count of the Loss of Line conditions seen on the interface during the current 15 minute performance data collection interval.
adslAtucPerfCurr15MinLprs	Number of Loss of Power errors seen on the interface during the current 15 minute performance data collection interval.
adslAtucPerfCurr15MinESS	Total number of Errored Seconds experienced by the interface during the current 15 minute performance data collection interval.
adslAtucPerfCurr15MinInits	Number of line initializations performed on the interface during the current 15 minute performance data collection interval.
adslAtucPerfCurr1DayTimeElapsed	Number of seconds elapsed since the start of the current 1 day time interval.
adslAtucPerfCurr1DayLofs	Number of Loss of Framing errors seen on the interface during the currently active 1 day performance data collection interval.
adslAtucPerfCurr1DayLoss	Number of Loss of Signal errors observed on the interface during the current 1 day performance data collection interval.
adslAtucPerfCurr1DayLols	Count of the Loss of Line conditions seen on the interface during the currently active 1 day performance data collection interval.
adslAtucPerfCurr1DayLprs	Number of Loss of Power errors seen on the interface during the currently active 1 day performance data collection interval.
adslAtucPerfCurr1DayESS	Total number of Errored Seconds experienced by the interface during the currently active 1 day performance data collection interval.

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adslAtucPerfCurr1DayInits	Number of line initializations performed on the interface during the current 1 day performance data collection interval.
adslAtucPerfPrev1DayMoniSecs	Number of seconds in the previous 1 day time interval for which performance data was collected.
adslAtucPerfPrev1DayLofs	Number of Loss of Framing errors seen on the interface during the last full 1 day performance data collection interval.
adslAtucPerfPrev1DayLoss	Number of Loss of Signal errors observed on the interface during the last full 1 day performance data collection interval.
adslAtucPerfPrev1DayLols	Count of the Loss of Line conditions seen on the interface during the last full 1 day performance data collection interval.
adslAtucPerfPrev1DayLprs	Number of Loss of Power errors seen on the interface during the last full 1 day performance data collection interval.
adslAtucPerfPrev1DayESs	Total number of Errored Seconds experienced by the interface during the last full 1 day performance data collection interval.
adslAtucPerfPrev1DayInits	Number of line initializations performed on the interface during the last full 1 day performance data collection interval.
adslAtucPerfTimeElapsed	Number of seconds elapsed since the last initialization of the BAS.

```
show interface adsl {<port>} adslatucphystable
```

Summary Show the characteristics and settings of the ADSL line's transceiver.

Required Mode Global Config

User-Entered *<port>*

Parameters The <port> parameter is the number of an ADSL port identifying a single ADSL line.

Description This command presents a table of physical characteristics and settings of the ADSL Transceiver Unit that provides ADSL connectivity for the selected line at the BAS. This transceiver instance is called the ADSL Transceiver Unit - Central Office side, or ATU-C. This information identifies hard-coded characteristics, such as manufacturer serial numbers, and observed statistics, such as the operational speed, attenuation, and power levels, or other physical characteristics.

Example**6.13****ADSL
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```

BASR(config)# show interface adsl 17 adslatucphystable
Port 17
adslatucphystable:
  adslAtucInvSerialNumber:    BASR_FW_2.2
  adslAtucSystemVendorID:    E.67.1.39
  adslAtucInvVersionNumber:   FFB54753504E0000
  adslAtucCurrSnrMgn:         60
  adslAtucCurrAtn:            0
  adslAtucCurrStatus:         noDefect (0x1)
  adslAtucCurrOutputPwr:      83
  adslAtucCurrAttainableRate: 24169946
  adslAtucDMTBinBits:         0x00 0x00 0x00 0x00 0x00 0x00 0x07 0x0a
                                0x0b 0x0b 0x0c 0x0d 0x0d 0x0e 0x0e 0x0e
                                0x0f 0x0f 0x0f 0x0f 0x0f 0x0f 0x0e 0x0f
                                0x0f 0x0e 0x0e 0x0e 0x0d 0x0c 0x0c 0x0b

  adslAtucOpState:            DATA
  adslAtucActualStandard:     adsl2+
  adslAtucStartProgress:      0
  adslAtucTxAtmCellCounter:    21149016
  adslAtucRxAtmCellCounter:    24142414
  adslAtucChanPerfCU:         24142414
  adslAtucIdleBertCells:      0
  adslAtucIdleBertError:      0
  adslAtucBertSync:           BERT OUT OF SYNC
  adslAtucBertError:          0
  adslAtucChipVersion:        25
  adslAtucDataBoostStatus:     enable
  adslAtucChanPerfCD:         7345280
  adslAtucPMState:            LO
  adslAtucChanPerfBE:         0
  adslAtucMSGds:              18213
  adslAtucPilotTone:          9595
  adslAtucLocalCodingGain:     11
  adslAtucPsdMaskMode:         0
  adslAtucSelfTestResult:      0
  adslAtucG9941VendorID:      FFB54753504E0000
  adslAtucStartBin:           0
  adslAtucStartupErrorCode:    0
  adslAtucBitSwapCount:       346

```

Command Output: The following information is shown on in the ATU-C physical information table:

adslAtucInvSerialNumber	The Pannaway product serial number of the BAS, set at manufacture.
adslAtucInvVendorID	The vendor identification number assigned to the BAS.
adslAtucInvVersionNumber	The version and revision number of the BAS hardware.
adslAtucCurrSnrMgn	The observed Signal-to-Noise Ratio (SNR) margin (in tenths of a decibel) on the Central Office end of the ADSL Transceiver Unit (ATU-C).
adslAtucCurrAtn	The difference (in tenths of a decibel) between the received ATU-C power and the claimed transmit power of the peer connected to this interface.

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adslAtucCurrStatus	<p>The current state of the ATU-C line. Possible conditions include no defect (no defects on the line), LOF (loss of framing – failure due to not receiving valid frame), LOS (loss of signal – failure due to not receiving signal), LPR (loss of power – failure due to loss of power), LOL (loss of link – ATU-C failure due to inability to link with ATU-R), loss of signal quality (noise margin fell below minimum noise margin, or bit error rate exceeds 10^{-7}, data initialization failure (failure due to bit errors corrupting start-up exchange), config initialization failure (initialization failure due to peer ATU not able to support requested configuration), protocol initialization failure (initialization failure due to incompatible protocol used by peer ATU), or no peer detected (no activation sequence detected from peer ATU).</p> <p>There are also separate status conditions returned if the port is ADSL 2/2+ DELT mode.</p>
adslAtucCurrOutputPwr	Measured total output power (in tenths of a decibel) for this ATU-C during the last initialization sequence.
adslAtucCurrAttainableRate	Maximum attainable data rate (in bits per second) for this ATU.
adslAtucDMTBinBits	This table represents the contents of 32 bins (0 to 31) used to organize ADSL data for DMT communications. The number shown in each cell is the count of bits in each of the 32 bins. During normal operation, each bin should contain from 0 (0x00) to 15 (0x0f) bits.
adslAtucOpState	Operational mode or state of the interface, showing idle, handshake, training, or test status.
adslAtucActualStandard	Observed ATU-C operating standard being used by the interface. This field displays the outcome of the initialization negotiation between the ATU-C and the ATU-R at the remote site.
adslAtucStartProgress	Current startup state of the transceiver.
adslAtucTxAtmCellCounter	Number of data cells transmitted by the ATU-C.
adslAtucRxAtmCellCounter	Number of encoded cells received by the ATU-C.
adslAtucChanPerfCU	For ADSL2/2+, the near end data-only cell count. This is a count of the total number of cells in the ATM Data Path delivered at the V-C (for ATU-C) interface.
adslAtucIdleBertCells	Number of Idle Bit Error Rate cells received on this interface.
adslAtucIdleBertError	Count of the total number of Bit Error Rate Test (BERT) failures noted for idle cells received on this interface.
adslAtucBertSync	Synchronization status of the interface.
adslAtucBertError	Number of errors detected during BERT operations.
adslAtucDataBoostStatus	Configuration status (enabled or disabled) of the interface's DataBoost mode.
adslAtucPilotTone	For ADSL2/2+, the receiver determined bin number location of the pilot tone in the downstream direction.
adslAtucChanPerfCD	For ADSL2/2+, the near end delineated total cell count. This is a count of the total number of cells passed through the cell delineation and HEC function process operating on the ATM Data Path while in the SYNC state.
adslAtucPMState	For ADSL2/2+, the Line Power Management State.

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adslAtucChanPerfBE	For ADSL2/2+, the near-end idle bit error count. This is a count of the number of bit errors in the idle cell payload received in the ATM Data Path at the near-end.
adslAtucMSGds	For ADSL2/2+, the actual bandwidth of the downstream OAM channel in bps.

```
show interface adsl {<port>} adslatuctraps
```

Summary Show a table of trap flags for the ADSL port's ATU-C interface.

Required Mode Global Config

User-Entered *<port>*

Parameters The *<port>* parameter is the number of an ADSL port identifying a single ADSL line.

Description This command presents a list of the ATU-C traps that the BAS tracks and reports, and provides the current condition of each trap's flag (set: 0x1 or unset: 0x0). If a trap shows the "set" designation, then the trap condition has been met and an alarm has been generated for the selected ADSL port.

Example

```
BASR(config)# show interface adsl 17 adslatuctraps
Port 17
adslatuctraps:
adslAtucPerfLofsThreshTrap:      0
adslAtucPerfLossThreshTrap:      0
adslAtucPerfLolsThreshTrap:      0
adslAtucPerfLprsThreshTrap:      0
adslAtucPerfESsThreshTrap:       0
adslAtucInitFailureTrap:         0
adslAtucRateChangeTrap:          0
adslAturPerfLofsThreshTrap:      0
adslAturPerfLossThreshTrap:      0
adslAturPerfLprsThreshTrap:      0
adslAturPerfESsThreshTrap:       0
adslAturRateChangeTrap:          0
adslAtucOpStateTrap:             1
adslAtucLockupTrap:              0
adslAtucPMStateTrap:             0
adslAtucRateRatioChangeTrap:     0
adslAtucCommandFailureTrap:      0
```

Command Output: The following information is shown in the ATU-C traps table:

adslAtucPerfLofsThreshTrap	Indicates if the BAS Loss of Framing error threshold for the ATU has been reached, triggering the generation of a trap.
adslAtucPerfLossThreshTrap	Shows if the ATU-C's Loss of Signal error threshold has been reached, which should result in the generation of a trap.
adslAtucPerfLolsThreshTrap	Indicates if a Loss of Line error threshold has been passed by the current ATU, triggering the generation of a trap.
adslAtucPerfLprsThreshTrap	Shows if a Loss of Power condition trap has been generated by the BAS.

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adslAtucPerfESsThreshTrap	Shows if an Errored Seconds trap has been generated by the BAS.
adslAtucNitFailureTrap	Indicates if a trap has been generated by the BAS to mark the failure of an ATU-C to initialize.
adslAtucRateChangeTrap	Shows if the interface's ATU-C has changed operational rate and generated a trap.
adslAturPerfLofsThreshTrap	Indicates if the Loss of Framing error threshold for the Remote (subscriber side) ATU has been reached, triggering the generation of a trap.
adslAturPerfLossThreshTrap	Shows if the ATU-R's Loss of Signal error threshold has been reached, which should result in the generation of a trap.
adslAturPerfLprsThreshTrap	Shows if a Loss of Power condition trap has been generated by the remote ATU.
adslAturPerfESsThreshTrap	Shows if an Errored Seconds trap has been generated by the remote ATU.
adslAturRateChangeTrap	Shows if the ATU-R interface of the remote equipment connected to this BAS interface has changed operational rate and generated a trap.
adslAtucOpStateTrap	Indicates a change in the operational state of the ADSL Transceiver Unit.
adslAtucLockupTrap	This field shows if a chip or transceiver lockup condition has occurred on the interface.

Related Commands

adsllinealarmconfprofiletable adslatucinitfailuretrapenable {enable | disable} on page 6-16

adsllinealarmconfprofiletable adslatucopstatetrapenable {enable | disable} on page 6-17

adsllinealarmconfprofiletable adslatucthresh15miness {<seconds>} on page 6-17

adsllinealarmconfprofiletable adslatucthresh15minlofs {<seconds>} on page 6-18

adsllinealarmconfprofiletable adslatucthresh15minlols {<seconds>} on page 6-18

adsllinealarmconfprofiletable adslatucthresh15minloss {<seconds>} on page 6-19

adsllinealarmconfprofiletable adslatucthresh15minlprs {<seconds>} on page 6-20

adsllinealarmconfprofiletable adslatucthreshfastratedown {<bps change>} on page 6-20

adsllinealarmconfprofiletable adslatucthreshfastrateup {<bps change>} on page 6-21

adsllinealarmconfprofiletable adslatucthreshinterleaveratedown {<bps change>} on page 6-21

adsllinealarmconfprofiletable adslatucthreshinterleaverateup {<bps change>} on page 6-22

adsllinealarmconfprofiletable adslaturthresh15miness {<seconds>} on page 6-23

adsllinealarmconfprofiletable adslaturthresh15minlofs {<seconds>} on page 6-23

adsllinealarmconfprofiletable adslaturthresh15minloss {<seconds>} on page 6-24

adsllinealarmconfprofiletable adslaturthresh15minlprs {<seconds>} on page 6-24

adsllinealarmconfprofiletable adslaturthreshfastratedown {<bps change>} on page 6-25

adsllinealarmconfprofiletable adslaturthreshfastrateup {<bps change>} on page 6-26

adsllinealarmconfprofiletable adslaturthreshinterleaveratedown {<bps change>} on page 6-26

adsllinealarmconfprofiletable adslaturthreshinterleaverateup {<bps change>} on page 6-27

adsllinealarmconfprofiletable adsllinealarmconfprofilerowstatus {active | outofservice} on page 6-27

6.13

ADSL
Monitoring
Commands

```
show interface adsl {<port>} adslaturintervaltable
```

Summary Shows the number of times the interface has experienced various error conditions in the most recent 15 minute monitoring interval.

Required Mode Global Config

User-Entered Parameters *<port>*
The *<port>* parameter is the number of an ADSL port identifying a single ADSL line.

Description This command shows information collected and reported by the remote site ADSL Transceiver Unit (ATU-R) connected to the specified line. The information reflects the number of times in the last 15 minute monitoring time interval that a Severely Errored Seconds or Unavailable Seconds error occurred on the remote ATU-R.

Example

```
BASR(config)# show interface adsl 17 adslaturintervaltable
Port 17
adslaturintervaltable:
adslAturIntervalSesL:      0
adslAturIntervalUasL:      0
adslAturIntervalFecsL:     528
```

Command Output: The following information is shown for the ATU-R:

adslAturIntervalSesL	Number of seconds in the current 15 minute time interval that experienced Severely Errored Seconds conditions.
adslAturIntervalUasL	Seconds in the current 15 minute time interval in which Unavailable Errored Seconds occurred.
adslAturIntervalFecsL	Seconds in the current 15 minute time interval with one or more Forward Error Correction anomalies.

```
show interface adsl {<port>} adslaturintervaltable
```

Summary Show ATU-R error and condition information.

Required Mode Global Config

User-Entered Parameters *<port>*
The *<port>* parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

Description This command shows the contents of the BAS's Remote side ADSL Transceiver Unit (ATU-R) extended interval information table. This table tracks the occurrence of certain events such as Fast Retrains, Errored Seconds, and Unavailable Seconds conditions. These events are presented separately from the ATU-R Interval Information table because the events displayed in the table are not considered standard output for ADSL monitoring commands under RFC 2662; instead they are described in RFC 3440 (the extended line configuration profile table). The information shown in the table applies to the most recent 15 minute monitoring time interval for the ATU-R.

Example

```

BASR(config)# show interface adsl 17 adslaturintervaltable
Port 17
adslaturintervaltable:
  adslAturIntervalNumber:      1
  adslAturIntervalLofs:        0
  adslAturIntervalLoss:        0
  adslAturIntervalLprs:        0
  adslAturIntervalESs:         1
  adslAturIntervalValidData:   1

```

6.13**ADSL
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Commands**

Command Output: The following information is shown in the ATU-R Interval table:

adslAturIntervalNumber	The sequence number (from 1 to 96) of the 15 minute monitoring time interval that the displayed statistics are from. A value of 1 indicates the most recent complete monitoring interval, while a value of 96 indicates the interval completed 24 hours ago.
adslAturIntervalLofs	Number of Loss of Framing errors seen on the ATU-R during the current 15 minute performance data collection interval.
adslAturIntervalLoss	Number of Loss of Signal errors observed on the ATU-R during the current 15 minute performance data collection interval.
adslAturIntervalLprs	Count of the Loss of Line conditions seen on the ATU-R during the current 15 minute performance data collection interval.
adslAturIntervalESs	Number of Loss of Power errors seen on the ATU-R during the current 15 minute performance data collection interval.
adslAturIntervalValidData	A marker showing if the data collected for the time interval can be considered fully valid. Data may be suspect if this field does not display "1".

```
show interface adsl {<port>} adslaturperfdexttable
```

Summary Show ATU-R performance information.

Required Mode Global Config

User-Entered Parameters **<port>**

The <port> parameter is the number of an ADSL port identifying a single ADSL line.

Description This command shows the contents of the BAS's Remote side ADSL Transceiver Unit (ATU-R) Performance Data Extension table. This table presents information about the operation of the ATU-R at the remote end of the ADSL line, including the occurrence of several types of errors. These events are presented separately from the ATU-R Performance Data table because the events displayed in the table are not considered standard output for ADSL monitoring commands under RFC 2662.

Example

```

BASR(config)# show interface adsl 17 adslaturperfdataexttable
Port 17
adslaturperfdataexttable:
  adslAturPerfStatSesL:          0
  adslAturPerfStatUasL:          0
  adslAturPerfCurr15MinSesL:     0
  adslAturPerfCurr15MinUasL:     0
  adslAturPerfCurr1DaySesL:      0
  adslAturPerfCurr1DayUasL:      0
  adslAturPerfPrev1DaySesL:      0
  adslAturPerfPrev1DayUasL:      0
  adslAturPerfStatFecsL:         1305
  adslAturPerfStatLossL:         0
  adslAturPerfCurr15MinFecsL:    20
  adslAturPerfCurr1DayFecsL:     1305
  adslAturPerfPrev1DayFecsL:     0

```

Command Output: The following data is shown in the ADSL ATU-R Performance Data Extension table:

adslAturPerfStatSesL	The number of Severely Errored Second Line errors observed on the ATU-R since the most recent reset.
adslAturPerfStatUasL	The count of Unavailable Errored Seconds seen on the ATU-R since the most recent reset.
adslAturPerfCurr15MinSesL	The number of Severely Errored Second Line errors observed on the ATU-R in the current 15 minute monitoring time interval.
adslAturPerfCurr15MinUasL	The count of Unavailable Errored Seconds seen on the ATU-R during the current 15 minute time interval.
adslAturPerfCurr1DaySesL	The number of Severely Errored Second Line errors observed on the ATU-R in the current 1 day monitoring time interval.
adslAturPerfCurr1DayUasL	The count of Unavailable Errored Seconds seen on the ATU-R during the current 1 day time interval.
adslAturPerfPrev1DaySesL	The number of Severely Errored Second Line errors observed on the ATU-R in the previous 1 day monitoring time interval.
adslAturPerfPrev1DayUasL	The count of Unavailable Errored Seconds seen on the ATU-R during the previous 1 day time interval.
adslAturPerfStatFecsL	For ADSL2/2+, the count of 1-second intervals containing one or more far end forward error correction (FFEC) anomalies.
adslAturPerfStatLossL	For ADSL2/2+, the count of 1-second intervals containing one or more far end loss of signal (LOS) defects.
adslAturPerfCurr15MinFecsL	For ADSL2/2+, the count of 1-second intervals, in the current 15 minute interval, with one or more far end forward error correction (FFEC) anomalies.
adslAturPerfCurr1DayFecsL	For ADSL2/2+, the count of 1-second intervals, in the current 24 hour interval, with one or more far end forward error correction (FFEC) anomalies.
adslAturPerfPrev1DayFecsL	For ADSL2/2+, the count of 1-second intervals, in the most recent previous 1-day period, with one or more far end forward error correction (FFEC) anomalies.

6.13

ADSL
Monitoring
Commands

```
show interface adsl {<port>} adslaturperfdatabl
```

Summary Show performance data for the ADSL line's ATU-R interface.

Required Mode Global Config

User-Entered Parameters *<port>*
The <port> parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

Description This command shows the contents of the remote side ADSL Transceiver Unit (ATU-R) Performance Data table with respect to the BAS, as defined in RFC 2662. The table presents a set of collected performance and operation information for the selected ADSL port's ATU-R interface. This information includes Loss and Error conditions and interface operating time elapsed.

Example

```
BASR(config)# show interface adsl 17 adslaturperfdatabl
Port 17
adslaturperfdatabl:
adslAturPerfLofs:          0
adslAturPerfLoss:          0
adslAturPerfLprs:          0
adslAturPerfESs:           4
adslAturPerfValidIntervals: 4
adslAturPerfInvalidIntervals: 92
adslAturPerfCurr15MinTimeElapsed: 126
adslAturPerfCurr15MinLofs: 0
adslAturPerfCurr15MinLoss: 0
adslAturPerfCurr15MinLprs: 0
adslAturPerfCurr15MinESs: 1
adslAturPerfCurr1DayTimeElapsed: 3554
adslAturPerfCurr1DayLofs: 0
adslAturPerfCurr1DayLoss: 0
adslAturPerfCurr1DayLprs: 0
adslAturPerfCurr1DayESs: 4
adslAturPerfPrev1DayMoniSecs: 0
adslAturPerfPrev1DayLofs: 0
adslAturPerfPrev1DayLoss: 0
adslAturPerfPrev1DayLprs: 0
adslAturPerfPrev1DayESs: 0
```

Command Output: The following information is shown in the ATU-R Performance Data table:

adslAturPerfLofs	Number of Loss of Framing errors seen on the interface since the last initialization.
adslAturPerfLoss	Number of Loss of Signal errors observed on the interface since the last initialization.
adslAturPerfLprs	Number of Loss of Power errors seen on the interface since the last reset.
adslAturPerfESs	Number of Loss of Framing errors seen on the interface since the last initialization.
adslAturPerfValidIntervals	Number of Loss of Signal errors observed on the interface since the last initialization.

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ADSL Monitoring Commands

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adslAturPerfInvalidIntervals	Number of Loss of Power errors seen on the interface since the last reset.
adslAturPerfCurr15MinTimeElapsed	Total number of Errored Seconds experienced by the interface during the current 15 minute time interval.
adslAturPerfCurr15MinLofs	Number of Loss of Framing errors seen on the interface in the current 15 minute monitoring time interval.
adslAturPerfCurr15MinLoss	Number of Loss of Signal errors observed on the interface during the current 15 minute time interval.
adslAturPerfCurr15MinLprs	Number of Loss of Power errors seen on the interface in the current 15 minute monitoring time interval.
adslAturPerfCurr15MinESs	Total number of Errored Seconds experienced by the interface during the current 15 minute time interval.
adslAturPerfCurr1DayTimeElapsed	Number of seconds that have elapsed since the start of the current 1 day time interval.
adslAturPerfCurr1DayLofs	Number of Loss of Framing errors seen on the interface in the current 1 day time interval.
adslAturPerfCurr1DayLoss	Number of Loss of Signal errors observed on the interface during the current 1 day time interval.
adslAturPerfCurr1DayLprs	Number of Loss of Power errors seen on the interface in the current 1 day monitoring time interval.
adslAturPerfCurr1DayESs	Total number of Errored Seconds experienced by the interface during the current 1 day time interval.
adslAturPerfPrev1DayMoniSecs	Number of seconds in the previously completed 1 day time interval for which performance data was collected.
adslAturPerfPrev1DayLofs	Number of Loss of Framing errors seen on the interface in the previous 1 day time interval.
adslAturPerfPrev1DayLoss	Number of Loss of Signal errors observed on the interface during the previous 1 day time interval.
adslAturPerfPrev1DayLprs	Number of Loss of Power errors seen on the interface in the previous 1 day monitoring time interval.
adslAturPerfPrev1DayESs	Total number of Errored Seconds experienced by the interface during the previous 1 day time interval.

```
show interface adsl {<port>} adslaturphystable
```

Summary Shows the configuration and status of the ATU-R physical interface.

Required Mode Global Config

User-Entered *<port>*

Parameters The <port> parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

Description This command presents a table of physical characteristics and settings of the ADSL Transceiver Unit that provides ADSL connectivity for the selected line at the remote site. This transceiver instance is called the ADSL Transceiver Unit – Remote side, or ATU-R. This information identifies hard-coded characteristics, such as manufacturer serial numbers, and observed statistics, such as the operational speed, attenuation, and power levels, or other physical characteristics.

Example

```

BASR(config)# show interface adsl 17 adslaturphystable
Port 17
adslaturphystable:
  adslAturInvSerialNumber:
  adslAturSystemVendorID:
  adslAturInvVersionNumber:    FFB54753504E000D
  adslAturCurrSnrMgn:         60
  adslAturCurrAtn:            0
  adslAturCurrStatus:         noDefect (0x1)
  adslAturCurrOutputPwr:      0
  adslAturCurrAttainableRate: 1323269
  adslAturDMTBinBits:         0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
                                0x00 0x00 0x00 0x00 0x00 0x02 0x03 0x04
                                0x05 0x05 0x05 0x06 0x07 0x07 0x07 0x08
-----
EXAMPLE CUT HERE
-----
                                0x0c 0x0c 0x0c 0x0c 0x0c 0x0c 0x0c 0x0c
                                0x0c 0x0c 0x0c 0x0c 0x0c 0x0c 0x0b 0x0b
                                0x0b 0x0b 0x0a 0x0a 0x0a 0x09 0x08 0x07

adslAturConfig:
adslAturChanPerfCD:           191714132
adslAturChanPerfCU:           30741768
adslAturChanPerfBE:           0
adslAturMSGus:                39379
adslAturSelfTestResult:       0
adslAturG9941VendorID:        0000000000000000
adslAturGsBitSwapCount:       0
adslAturGsPsdMaskMode:        0

```

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Command Output: The following information is shown in the ATU-R Physical information table:

adslAturInvSerialNumber	The product serial number identifying the ATU-R.
adslAturInvVendorID	The vendor identification number assigned to the ATU.
adslAturInvVersionNumber	The version and revision number of the ATU-R hardware.
adslAturCurrSnrMgn	The observed Signal-to-Noise Ration (SNR) margin on the remote end of the ADSL Transceiver Unit (ATU-R).
adslAturCurrAtn	The difference between the received ATU-R power and the claimed transmit power of the peer connected to this interface.

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adslAturCurrStatus	<p>The current operating state of the ATU-R line. Possible states include no defect (no defects on the line), LOF (loss of framing – failure due to not receiving valid frame), LOS (loss of signal – failure due to not receiving signal), LPR (loss of power – failure due to loss of power), or loss of signal quality (noise margin fell below minimum noise margin, or bit error rate exceeds 10^{-7}, data initialization failure (failure due to bit errors corrupting start-up exchange).</p> <p>In addition, the following states can be returned while operating in ADSL2/ADSL2+ mode: loss of margin (SNR margin is below the minimum SNR margin, and an increase of SNR margin is no longer possible), rate adaptation upshift (in SRA mode, the SNR margin is above the Upshift Noise Margin for a period longer than the time interval for UpShift Rate Adaptation), and rate adaptation downshift (in SRA mode, the SNR margin is below the Downshift Noise Margin for a period longer than the time interval for DownShift Rate Adaptation).</p> <p>There are also separate status conditions returned if the port is ADSL 2/2+ DELT mode.</p>
adslAturCurrOutputPwr	Measured total output power for this ATU-R during the last initialization sequence.
adslAturCurrAttainableRate	Maximum attainable data rate for this ATU-R.
adslAturDMTBinBits	This table represents the contents of 256, 512, or 1024 bit bins used by the ATU-R to organize ADSL data for DMT communications. The number shown in each cell is the count of bits in each of the bins. During normal operation, each bin should contain from 0 (0x00) to 15 (0x0f) bits.
adslAturConfig	Upstream and downstream configuration data.
adslAturChanPerfCD	For ADSL2/2+, the far end delineated total cell count. This is a count of the total number of cells passed through the cell delineation and HEC function process operating on the ATM Data Path while in the SYNC state.
adslAturChanPerfCU	For ADSL2/2+, the far end data-only cell count. This is a count of the total number of cells in the ATM Data Path delivered at the T-R (for ATU-R) interface.
adslAturChanPerfBE	For ADSL2/2+, the far end idle bit error count. This is a count of the number of bit errors in the idle cell payload received in the ATM Data Path at the near-end.
adslAturMSGds	For ADSL2/2+, the actual bandwidth of the upstream OAM channel in bps.

```
show interface adsl {<port>} adslxstatutraps
```

Summary Shows the condition of the extended ATU-C and ATU-R trap settings.

Required Mode Global Config

User-Entered Parameters *<port>*

The *<port>* parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

Description This command presents a list of the extended ATU-C and ATU-R traps that the BAS tracks and reports, and provides the current condition of each trap's flag (set: 1 or unset: 0). If a trap shows the "set" designation, then a trap condition has been set.

Example

```
BASR(config)# show interface adsl 17 adslxstatutetraps
Port 17
adslxstatutetraps:
  adslAtucPerfSesLThreshTrap:      0
  adslAtucPerfUasLThreshTrap:      0
  adslAturPerfSesLThreshTrap:      0
  adslAturPerfUasLThreshTrap:      0
  adslAtucPerfFecsLThreshTrap:     0
  adslAtucPerfLofsThresh1DayTrap:  0
  adslAtucPerfLossThresh1DayTrap:  0
  adslAtucPerfLolsThresh1DayTrap:  0
  adslAtucPerfLprsThresh1DayTrap:  0
  adslAtucPerfESsThresh1DayTrap:   0
  adslAtucPerfSesLThresh1DayTrap:  0
  adslAtucPerfUasLThresh1DayTrap:  0
  adslAturPerfLofsThresh1DayTrap:  0
  adslAturPerfLossThresh1DayTrap:  0
  adslAturPerfLprsThresh1DayTrap:  0
  adslAturPerfESsThresh1DayTrap:   0
  adslAturPerfSesLThresh1DayTrap:  0
  adslAturPerfUasLThresh1DayTrap:  0
  adslAturPerfFecsLThreshTrap:     0
  adslAtucPerfFecsLThresh1DayTrap: 0
  adslAturPerfFecsLThresh1DayTrap: 0
```

Command Output: The following information is shown in the extended ATU-C/ATU-R traps table:

adslAtucPerfSesLThreshTrap adslAturPerfSesLThreshTrap	Indicates whether a Severely Errored Seconds trap is set for the near-end (atu-c) or far-end (atu-r) for the current 15 minute interval.
adslAtucPerfUasLThreshTrap adslAtucPerfUasLThreshTrap	Indicates whether an Unavailable Seconds error trap is set for the near-end (atu-c) or far-end (atu-r) for the current 15 minute interval.
adslAtucPerfFecsLThreshTrap adslAturPerfFecsLThreshTrap adslAtucPerfFecsLThresh1DayTrap adslAturPerfFecsLThresh1DayTrap	Indicates whether the Forward Error Correction - Seconds Line trap is set for the near-end (atu-c) or far-end (atu-r) for the current 15 minute or 1 day interval.
adslAtucPerfLofsThresh1DayTrap adslAturPerfLofsThresh1DayTrap	Indicates whether the Loss of Framing - Seconds trap is set for the near-end (atu-c) or far-end (atu-r) for the current 1 day interval.
adslAtucPerfLossThresh1DayTrap adslAturPerfLossThresh1DayTrap	Indicates whether the Loss of Signal - Seconds trap is set for the near-end (atu-c) or far-end (atu-r) for the current 1 day interval.
adslAtucPerfLolsThresh1DayTrap	Indicates whether the Loss of Link - Seconds trap is set for the near-end (atu-c) for the current 1 day interval.
adslAtucPerfLprsThresh1DayTrap adslAturPerfLprsThresh1DayTrap	Indicates whether the Loss of Power - Seconds trap is set for the near-end (atu-c) or far-end (atu-r) for the current 1 day interval.
adslAtucPerfESsThresh1DayTrap adslAturPerfESsThresh1DayTrap	Indicates whether the Errored Seconds trap is set for the near-end (atu-c) or far-end (atu-r) for the current 1 day interval.

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ADSL Monitoring Commands

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Related Commands

- adslalarmconfprofileexttable adslatucthreshold15minfecsl {<count>} on page 6-6
- adslalarmconfprofileexttable adslaturthreshold15minfecsl {<count>} on page 6-6
- adslalarmconfprofileexttable adslatucthreshold1dayfecsl {<count>} on page 6-6
- adslalarmconfprofileexttable adslaturthreshold1dayfecsl {<count>} on page 6-6
- adslalarmconfprofileexttable adslatucthreshold15minsesl {<seconds>} on page 6-6
- adslalarmconfprofileexttable adslaturthreshold15minsesl {<seconds>} on page 6-6
- adslalarmconfprofileexttable adslatucthreshold1daysesl {<seconds>} on page 6-6
- adslalarmconfprofileexttable adslaturthreshold1daysesl {<seconds>} on page 6-6
- adslalarmconfprofileexttable adslatucthreshold15minuasl {<seconds>} on page 6-7
- adslalarmconfprofileexttable adslaturthreshold15minuasl {<seconds>} on page 6-7
- adslalarmconfprofileexttable adslatucthreshold1dayuasl {<seconds>} on page 6-7
- adslalarmconfprofileexttable adslaturthreshold1dayuasl {<seconds>} on page 6-7
- adslalarmconfprofileexttable adslatucthreshold1dayess {<seconds>} on page 6-8
- adslalarmconfprofileexttable adslaturthreshold1dayess {<seconds>} on page 6-8
- adslalarmconfprofileexttable adslatucthreshold1daylofs {<seconds>} on page 6-9
- adslalarmconfprofileexttable adslaturthreshold1daylofs {<seconds>} on page 6-9
- adslalarmconfprofileexttable adslatucthreshold1daylols {<seconds>} on page 6-9
- adslalarmconfprofileexttable adslatucthreshold1dayloss {<seconds>} on page 6-10
- adslalarmconfprofileexttable adslaturthreshold1dayloss {<seconds>} on page 6-10
- adslalarmconfprofileexttable adslatucthreshold1daylprs {<seconds>} on page 6-11
- adslalarmconfprofileexttable adslaturthreshold1daylprs {<seconds>} on page 6-11

```
show interface adsl {<port>} adsllineexttable
```

Summary Show the ADSL Line Extension table.

Required Mode Global Config

User-Entered Parameters **<port>**
The <port> parameter is the number of an ADSL port identifying a single ADSL line.

Description The Line Extension table shown in this command's output provides configuration and line capability information that is defined in RFC 3440 (the extended line configuration profile table, that supplements RFC 2662). The supplementary information provided in the Line Extension table summarizes the capabilities of the ATU-C and ATU-R interfaces and shows the actual configuration the interfaces are working under.

Example

```

BASR# show interface adsl 17 adslLineExttable
Port 17
adslLineExttable:
  adslLineTransAtucCap:      0x31000000 0x1c80010d
    ansit1413                |t1.413 |-----|---|
    q9921PotsNonOverlapped   |g.dmt |annex a |fdm|
    q9921PotsOverlapped      |g.dmt |annex a |ec |
    q9922PotsNonOverlapped   |g.lite |annex a |fdm|
    q9923AnnexREADSL2PotsNonOverlapped |readsl2 |annex adsl2 |fdm|
    q9925AnnexADSL2PlusPotsNonOverlapped |adsl2+ |annex adsl2 |fdm|
    q9925AnnexADSL2PlusPotsOverlapped |adsl2+ |annex adsl2 |ec |
    q9923AnnexADSL2PotsNonOverlapped |adsl2 |annex adsl2 |fdm|
    q9923AnnexMPotsExtUsNonOverlapped |adsl2 m |annex m adsl2 |fdm|
    q9925AnnexMPotsExtUsNonOverlapped |adsl2+ m |annex m adsl2 |fdm|
    q9925AnnexMPotsExtUsOverlapped |adsl2+ m |annex m adsl2 |ec |
  adslLineTransAtucActual:   0x00000000 0x08000000
    q9925AnnexADSL2PlusPotsOverlapped |adsl2+ |annex adsl2 |ec |
  adslLineTransAturCap:      0x31000000 0x1c800000
    q9923AnnexREADSL2PotsNonOverlapped |readsl2 |annex adsl2 |fdm|
    q9925AnnexADSL2PlusPotsNonOverlapped |adsl2+ |annex adsl2 |fdm|
    q9925AnnexADSL2PlusPotsOverlapped |adsl2+ |annex adsl2 |ec |
    q9923AnnexADSL2PotsNonOverlapped |adsl2 |annex adsl2 |fdm|
    q9923AnnexMPotsExtUsNonOverlapped |adsl2 m |annex m adsl2 |fdm|
    q9925AnnexMPotsExtUsNonOverlapped |adsl2+ m |annex m adsl2 |fdm|
    q9925AnnexMPotsExtUsOverlapped |adsl2+ m |annex m adsl2 |ec |
  adslLineTransAtucConfig:   0x00000000 0x18800005
    ansit1413                |t1.413 |-----|---|
    q9921PotsNonOverlapped   |g.dmt |annex a |fdm|
    q9923AnnexREADSL2PotsNonOverlapped |readsl2 |annex adsl2 |fdm|
    q9925AnnexADSL2PlusPotsOverlapped |adsl2+ |annex adsl2 |ec |
    q9923AnnexADSL2PotsNonOverlapped |adsl2 |annex adsl2 |fdm|
  adslAtucCurrOutputPwr:     83
  adslAtucBinSNRMargin:      0x40 0x40 0x40 0x40 0x40 0x40 0x4e 0x4e
                                0x4e 0x4e 0x50 0x50 0x50 0x4e 0x4c 0x4c
                                0x4a 0x4a 0x4a 0x4a 0x4c 0x50 0x54 0x4c
                                0x50 0x4e 0x4c 0x4e 0x4a 0x4e 0x52 0x50

```

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Command Output: The following information is shown in the ADSL Line Extension table:

adslLineTransAtucCap	This section shows a table of the modes that <i>can</i> be supported by the BAS ATU-C.
adslLineTransAtucActual	This section presents a table of the <i>actual</i> transmission modes that the BAS ATU-C is supporting in the current connection.
adslLineTransAturCap	This section provides a table of transmission modes that can be supported by the ATU-R. This value may not be provided by all ATU-Rs; it will be provided by Pannaway's CPE gear.
adslLineTransAtucConfig	This section provides a table of transmission modes for which the ATU-C is currently configured.

```
show interface adsl {<port>} pm {atu-c | atu-r}
```

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ADSL Monitoring Commands

Summary Display monitoring data taken from the ATU-C or ATU-R Performance Data Table and Channel Performance Data Table, column-sorted into cumulative, current 15 minute, current day, and previous day information.

Required Mode Global Config

User-Entered *<port>*

Parameters The *<port>* parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

{atu-c / atu-r}

The *{atu-c | atu-r}* parameter selects data with respect to either the ATU-C or ATU-R's performance data tables.

Description This command outputs a column-sorted display of the ADSL Transceiver Unit Central Office-side (ATU-C) or ADSL Transceiver Unit Remote-side (ATU-R) Performance Data and Channel Performance Data table information.

The output is displayed for four monitoring intervals:

- cumulative – data collected since the last initialization of the BAS.
- curr15min – data collected during the current 15 minute statistics bin collection interval
- currDay – data collected during the current day (since midnight, as synchronized by the BAS system clock).
- prevDay – data collected during the previous day (from midnight to midnight of the previous day, as synchronized by the BAS system clock).



NOTE: The most accurate results are displayed when the BAS is synchronized to an NTP server; if the BAS is set to maintain its own timing, there might be a slight slipping of time over an extended period.

If you change the system clock in between iterations of this command, the displayed output may not be synchronized with the clock time. It may no longer represent a midnight-to-midnight count (although it is still based on a 96 15-minute bins or a 24 hour interval).

Example

```
BASR# show interface adsl 17 pm atu-c
Port 17 PM Data:
```

ATU-C	cumulative	curr15min	currDay	prevDay
elapsed:	1:04:41	7:33	1:04:41	0:00
LOFs:	0	0:00	0:00	0:00
LOSs:	0	0:00	0:00	0:00
LOLs:	0	0:00	0:00	0:00
LPRs:	0	0:00	0:00	0:00
ES:	0:00	0:00	0:00	0:00
SES:	0:00	0:00	0:00	0:00
UAS:	0:00	0:00	0:00	0:00
FECs:	2:47	0:18	2:47	0:00
Inits:	1	0	1	0
Inits Failed:	0	0	0	0

Interleaved Channel:

Rx Blocks:	209990	24915	209990	0
Tx Blocks:	232898	27633	232898	0
Corrected Blocks:	828	28	828	0
Uncorrected Blocks:	0	0	0	0
NCD:	0	0	0	0
OCD:	0	0	0	0
HEC:	0	0	0	0

```
BASR# show interface adsl 17 pm atu-r
Port 17 PM Data:
```

ATU-R	cumulative	curr15min	currDay	prevDay
elapsed:	1:04:44	7:36	1:04:44	0:00
LOFs:	0	0:00	0:00	0:00
LOSs:	0	0:00	0:00	0:00
LPRs:	0	0:00	0:00	0:00
ES:	0:04	0:01	0:04	0:00
SES:	0:00	0:00	0:00	0:00
UAS:	0:00	0:00	0:00	0:00
FECs:	23:14	1:49	23:14	0:00

Interleaved Channel:

Rx Blocks:	233081	27816	233081	0
Tx Blocks:	210155	25080	210155	0
Corrected Blocks:	2459	151	2459	0
Uncorrected Blocks:	4	1	4	0
NCD:	0	0	0	0
HEC:	0	0	0	0

Command Output: The following information is shown, on a per interface basis, when the command is performed.

An elapsed time is displayed for each interval.

elapsed	<p>The time elapsed during each interval:</p> <ul style="list-style-type: none"> • cumulative (since last initialization) is shown in HH:MM format if less than one day has elapsed, or N Days HH:MM format if over 24 hours has elapsed. • curr15min interval is in MM:SS format • currDay is in HH:MM:SS format (> 1 hour) or MM:SS format (< 1 hour) • prevDay reads 0:00 if no previous day statistics are collected, or displays the previous day time elapsed prior to 00:00 midnight (in HH:MM:SS format if > 1 hour or MM:SS format if < 1 hour) since the last initialization.
---------	---

6.13**ADSL**
Monitoring
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The following information is extracted from the ATU-C/ATU-R Performance Data table.

LOFs	Number of Loss of Framing seconds during the associated interval, tallied in MM:SS format (or as a total count for cumulative display).
LOSs	Count of Loss of Signal seconds during the associated interval, tallied in MM:SS format (or as a total count for cumulative display).
LOLs	Number of Loss of Link seconds during the associated interval, tallied in MM:SS format (or as a total count for cumulative display).
LPRs	Number of Loss of Power seconds during the associated interval, tallied in MM:SS format (or as a total count for cumulative display).
ES	Number of Errored Seconds during the associated interval, tallied in MM:SS format (or HH:MM:SS for cumulative display).
SES	Number of Severely Errored Seconds during the associated interval, tallied in MM:SS format (or HH:MM:SS for cumulative display).
UAS	Number of Unavailable Errored Seconds during the associated interval, tallied in MM:SS format (or HH:MM:SS for cumulative display).
FECs	Number of seconds with Forward Error Correction (FEC) anomalies during the associated interval, tallied in MM:SS format (or HH:MM:SS for cumulative display).
Inits (ATU-C only)	Number of line initializations occurring on the interface during the associated interval, including failed initializations.
Inits Failed (ATU-C only)	Number of line initialization failures occurring on the interface during the associated interval.

The following information is extracted from the ATU-C/ATU-R Fast or Interleaved Channel Performance Data Table.

Rx Blocks	Number of encoded blocks received by the channel during the associated interval.
Tx Blocks	Number of encoded blocks transmitted by the channel during the associated interval.
Corrected Blocks	Number of blocks with correctable errors that were received by the channel during the associated interval. These blocks were treated as valid blocks after the BAS corrected the error(s).
Uncorrected Blocks	Number of blocks received by the channel during the associated interval that had errors that could not be corrected.
NCD	Number of No Cell Delineation errors recorded on this channel during the associated interval.
OCD (ATU-C Only)	Number of Out Of Cell Delineation (OCD) events recorded on this channel during the associated interval.
HEC	Number of Header Error Check errors recorded on this channel during the associated interval.

Related Commands show interface adsl {<port> | <port-range> | all} pm summary on page 6-122

```
show interface adsl {<port>} pm interval {atu-c | atu-r} <all | hh:mm>
```

Summary Display monitoring data taken from the ATU-C or ATU-R Interval Table and Channel Interval Table, in column-sorted display format.

Required Mode Global Config

User-Entered Parameters *<port>*

The *<port>* parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

{atu-c | atu-r}

The *{atu-c | atu-r}* parameter selects data with respect to either the ATU-C or ATU-R's interval tables.

<all | hh:mm>

Determines the sampling of data to display.

- *all* displays data from every 15 minute interval bin collected during the previous 24 hours or since system initialization (up to 96 total).
- *hh:mm* displays data from a single bin collected during the previous 24 hours. *hh:mm* is in synchronization with the BAS system clock, where *hh* ranges from 00 (midnight) to 23 (11 pm), and *mm* is a boundary of 00, 15, 30, or 45 minutes. Note that the leading 0 is not required.

Description This command outputs a column-sorted display of the ATU-C or ATU-R Interval Table and Channel Interval Table information.



NOTE: The most accurate results are displayed when the BAS is synchronized to an NTP server; if the BAS is set to maintain its own timing, there might be a slight slipping of time over an extended period.

If you change the system clock in between iterations of this command, the displayed output may not be synchronized with the clock time. It may no longer represent a midnight-to-midnight count (although it is still based on a 96 15-minute bins or a 24 hour interval).

6.13

ADSL Monitoring Commands

Example**6.13****ADSL
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Commands**

```
BASR# show interface adsl 17 pm interval atu-r all
Port 17 PM Interval Data (current time: 16:08:39):
```

ATU-R

interval	elapsed	LOF	LOS	LPR	ES	SES	UAS	FEC
curr 16:00	8:38	0:00	0:00	0:00	0:01	0:00	0:00	2:03
1 15:45	15:00	0:00	0:00	0:00	0:01	0:00	0:00	0:53
2 15:30	15:00	0:00	0:00	0:00	0:00	0:00	0:00	0:38
3 15:15	15:00	0:00	0:00	0:00	0:01	0:00	0:00	0:33
4 15:00	12:08	0:00	0:00	0:00	0:01	0:00	0:00	0:25

Interleaved Channel

interval	elapsed	RxBlk	TxBk	CorBk	UncBk	NCD	HEC
curr 16:00	8:38	31598	28490	167	1	0	0
1 15:45	15:00	54900	49500	1126	1	0	0
2 15:30	15:00	54900	49500	383	0	0	0
3 15:15	15:00	54900	49500	509	1	0	0
4 15:00	12:08	40565	36575	290	1	0	0

```
BASR# show interface adsl 17 pm interval atu-c all
Port 17 PM Interval Data (current time: 16:08:49):
```

ATU-C

interval	elapsed	LOF	LOS	LOL	LPR	ES	SES	UAS	FEC	inits/fai
curr 16:00	8:48	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:19	0/0
1 15:45	15:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:53	0/0
2 15:30	15:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:38	0/0
3 15:15	15:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:33	0/0
4 15:00	12:08	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:25	1/0

Interleaved Channel

interval	elapsed	RxBlk	TxBk	CorBk	UncBk	NCD	OCD	HEC
curr 16:00	8:48	29040	32208	29	0	0	0	0
1 15:45	15:00	49500	54900	497	0	0	0	0
2 15:30	15:00	49500	54900	210	0	0	0	0
3 15:15	15:00	49500	54900	53	0	0	0	0
4 15:00	12:08	36575	40565	40	0	0	0	0

```
BASR# show interface adsl 17 pm interval atu-c 16:00
Port 17 PM Interval Data (current time: 16:09:08):
```

ATU-C

interval	elapsed	LOF	LOS	LOL	LPR	ES	SES	UAS	FEC	inits/fai
curr 16:00	9:07	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:22	0/0

Interleaved Channel

interval	elapsed	RxBlk	TxBk	CorBk	UncBk	NCD	OCD	HEC
curr 16:00	9:07	30085	33367	32	0	0	0	0

Command Output: The following information is shown, on a per interface basis, when the command is performed.

An index, interval time stamp, and elapsed time is displayed for each 15 minute interval bin, both for the ATU-C/ATU-R Performance Data Table and ATU-C/ATU-R Channel Performance Data Table information.

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interval	The index of the 15 minute bin: curr (current) or 1-96.
hh:mm timestamp	The timestamp of the associated bin, from 00:00 (midnight) to 23:45, at 15 minute boundaries as synchronized to the BAS system clock.
elapsed	The time elapsed during the 15 minute statistics bin collection interval, in MM:SS format. For any bin with a complete interval, this will be 15:00. For any bin that didn't reach the 15 minute boundary (the current bin, and possibly the first bin – 1 – collected after initialization), this indicates the actual time elapsed during the bin.

The following information is extracted from the ATU-C/ATU-R Performance Data table.

LOF	Number of Loss of Framing seconds during the associated interval, tallied in MM:SS format.
LOS	Number of Loss of Signal seconds during the associated interval, tallied in MM:SS format.
LOL	Number of Loss of Link seconds during the associated interval, tallied in MM:SS format.
LPR	Number of Loss of Power seconds during the associated interval, tallied in MM:SS format.
ES	Number of Errored Seconds during the associated interval, tallied in MM:SS format.
SES	Number of Severely Errored Seconds during the associated interval, tallied in MM:SS format).
UAS	Number of Unavailable Errored Seconds during the associated interval, tallied in MM:SS format.
FEC	Number of seconds with Forward Error Correction (FEC) anomalies during the associated interval, tallied in MM:SS format.
Inits/failed (ATU-C only)	Number of line initializations performed (including failures), and number of Initialization Failure events encountered, on the interface during the associated interval.

The following information is extracted from the ATU-C/ATU-R Fast or Interleaved Channel Performance Data Table.



NOTE: The ATU-R Channel Performance Data Table only provides information for the current 15 minute statistics collection bin.

RxBk	Number of encoded blocks received by the channel during the associated interval.
TxBk	Number of encoded blocks transmitted by the channel during the associated interval.
CorBk (Corrected Blocks)	Number of blocks with correctable errors that were received by the channel during the associated interval. These blocks were treated as valid blocks after the BAS corrected the error(s).
UncBk (Uncorrected Blocks)	Number of blocks received by the channel during the associated interval that had errors that could not be corrected.

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NCD	Number of No Cell Delineation errors recorded on this channel during the associated interval.
OCD (ATU-C Only)	Number of Out Of Cell (OCD) events recorded on this channel during the associated interval.
HEC	Number of Header Error Check errors recorded on this channel during the associated interval.

```
show interface adsl {<port> | <port-range> | all} pm summary
```

Summary Summarizes the cumulative monitoring data taken from the ATU-C or ATU-R Performance Data Table and Fast/Interleaved Channel Performance Data Table.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters *{<port> | <port-range> | all}*
Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

Description This command displays the cumulative monitoring data for the ADSL Transceiver Unit Central Office-side (ATU-C) or ADSL Transceiver Unit Remote-side (ATU-R) Performance Data and Channel Performance Data table information.

Example

```
BASR# show interface adsl 17-22 pm summary
```

Port	elapsed	inits	ATU-C				ATU-R				
			CorBk	UncBk	OCD	HEC	UAS	CorBk	UncBk	HEC	UAS
17	1:07:39	1/0	909	0	0	0	0:00	2503	4	0	
18	1:07:39	1/0	25	0	0	0	0:00	76	3	0	
19	1:07:39	1/0	2	1	0	0	0:00	58231	1004	0	
20	-										
21	-										
22	-										

Command Output The following data is displayed by this command for both the ATU-C and ATU-R sides of the connection (except as noted):

elapsed	The cumulative time elapsed (since last initialization) is shown in HH:MM format if less than one day has elapsed, or D+ HH:MM:SS format if over 24 hours has elapsed.
inits (ATU-C only)	Number of line initializations occurring on the interface during the elapsed interval, including failed initializations (initializations/initializations failed).
CorBk (Corrected Blocks)	Number of blocks that were received with errors on the fast/interleaved channel during the elapsed interval that were corrected. These blocks were treated as valid blocks after the BAS or CPE corrected the error(s), and passed on as good data.
UncBk (Uncorrected Blocks)	Number of blocks with uncorrectable errors that were received by the fast or interleaved channel during the elapsed interval.
OCD (ATU-C only)	Number of Out Of Cell (OCD) events recorded on the fast or interleaved channel during the elapsed interval.

HEC	Number of Header Error Check errors recorded on the fast or interleaved channel during the elapsed interval.
UAS	Number of Unavailable Errored Seconds during the elapsed interval, tallied in MM:SS format.

Related Commands show interface adsl {<port>} pm {atu-c | atu-r} on page 6-116

show interface adsl {<port>} pm threshold

Summary Display the threshold setting for the supported ADSL error and transmission rate change traps.

Required Mode Global Config

User-Entered <port>

Parameters The <port> parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

Description This command displays all thresholds set for the ADSL error and transmission rate change traps in the ATU-C/ATU-R Alarm Configuration Profile Table and Alarm Configuration Profile Extension Table that are supported by the BAS. Error traps can be configured on a per 15 minute statistics collection bin, or on a per day (96 bin) basis; rate change trap thresholds apply at each retrain event (based on the measured difference of transmission rate between initializations).



NOTE: A threshold setting of 0 indicates that the associated trap is disabled. Note also that some listed trap thresholds are not currently supported by the BAS.

Example

```
BASR(config)# show interface adsl 19 pm threshold
Port 19 PM Thresholds:
```

	ATU-C 15min	ATU-C Day	ATU-R 15min	ATU-R Day
LOF:	0	0	0	0
LOS:	0	0	0	0
LOL:	0	0	-	-
LPR:	0	0	0	0
ES:	0	0	0	0
SES:	0	0	0	0
UAS:	0	0	0	0
FEC:	0	0	0	0
FailedFastR:	0	-		

note: 0 = disabled

	ATU-C	ATU-R
FastRateUp:	4000	4000
InterleaveRateUp:	4000	4000
FastRateDown:	4000	4000
InterleaveRateDown:	4000	4000

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Command Output: The following information is shown, on a per interface basis, when the command is performed.

The following error threshold trap settings are displayed.

LOF	The threshold setting for the ATU-C 15 min, ATU-C day, ATU-R 15 min, and ATU-R day Loss of Framing seconds trap.
LOS	The threshold setting for the ATU-C 15 min, ATU-C day, ATU-R 15 min, and ATU-R day Loss of Signal seconds trap.
LOL	The threshold setting for the ATU-C 15 min and ATU-C day Loss of Link seconds trap. This is not applicable to the ATU-R side
LPR	The threshold setting for the ATU-C 15 min, ATU-C day, ATU-R 15 min, and ATU-R day Loss of Power seconds trap.
ES	The threshold setting for the ATU-C 15 min, ATU-C day, ATU-R 15 min, and ATU-R day Errored Seconds trap.
SES	The threshold setting for the ATU-C 15 min, ATU-C day, ATU-R 15 min, and ATU-R day Severely Errored Seconds trap.
UAS	The threshold setting for the ATU-C 15 min, ATU-C day, ATU-R 15 min, and ATU-R day Unavailable Errored Seconds trap.
FEC	The threshold setting for the ATU-C 15 min, ATU-C day, ATU-R 15 min, and ATU-R day Forward Error Correction (FEC) anomalies trap.
FailedFastR	The threshold setting for the ATU-C 15 min Failed Fast Retrain conditions trap. This is not applicable to any other interval.

The following transmission rate change trap settings are displayed.

FastRateUp	The threshold setting for the trap triggered on positive transmission rate change between initializations (for the fast channel).
InterleaveRateUp	The threshold setting for the trap triggered on positive transmission rate change between initializations (for the interleaved channel).
FastRateDown	The threshold setting for the trap triggered on negative transmission rate change between initializations (for the fast channel).
InterleaveRateDown	The threshold setting for the trap triggered on negative transmission rate change between initializations (for the interleaved channel).

Related Commands

- adslalarmconfprofileexttable adslatucthreshold15minfailedfast {<count>} on page 6-5
- adslalarmconfprofileexttable adslatucthreshold15minsesl {<seconds>} on page 6-6
- adslalarmconfprofileexttable adslatucthreshold15minuasl {<seconds>} on page 6-7
- adslalarmconfprofiletable adslatucthresh15minses {<seconds>} on page 6-17
- adslalarmconfprofiletable adslatucthresh15minlofs {<seconds>} on page 6-18
- adslalarmconfprofiletable adslatucthresh15minlols {<seconds>} on page 6-18
- adslalarmconfprofiletable adslatucthresh15minloss {<seconds>} on page 6-19
- adslalarmconfprofiletable adslatucthresh15minlprs {<seconds>} on page 6-20
- adslalarmconfprofiletable adslatucthreshfastratedown {<bps change>} on page 6-20
- adslalarmconfprofiletable adslatucthreshfastrateup {<bps change>} on page 6-21
- adslalarmconfprofiletable adslatucthreshinterleavedown {<bps change>} on page 6-21
- adslalarmconfprofiletable adslatucthreshinterleaverateup {<bps change>} on page 6-22
- adslalarmconfprofiletable adslaturthresh15minses {<seconds>} on page 6-23
- adslalarmconfprofiletable adslaturthresh15minlofs {<seconds>} on page 6-23
- adslalarmconfprofiletable adslaturthresh15minloss {<seconds>} on page 6-24

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adsllinealarmconfprofiletable adslaturthresh15minlprs {<seconds>} on page 6-24
 adsllinealarmconfprofiletable adslaturthreshfastratedown {<bps change>} on page 6-25
 adsllinealarmconfprofiletable adslaturthreshfastrateup {<bps change>} on page 6-26
 adsllinealarmconfprofiletable adslaturthreshinterleaveratedown {<bps change>} on page 6-26
 adsllinealarmconfprofiletable adslaturthreshinterleaverateup {<bps change>} on page 6-27

```
show interface adsl {<port> | <port-range> | all} uptime
```

Summary Displays the system uptime for ADSL CPEs connected to the BAS ports.

Required Mode Global Config

User-Entered Parameters {<port> / <port-range> / all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

Description This command displays uptime information for one or more ADSL CPE devices connected to the BAS. Uptime – defined as the elapsed time that the line has been connected in DATA mode – is displayed in ‘d h m s’ format. A dash ‘-’ indicates there is no CPE connected (or the port has not been initialized in DATA mode).

Example

```
BASR# show interface adsl 1-16 uptime
Port  Description      Uptime
-----
01          17h 0m 0s
02          -
03          -
04          -
05          -
06          -
07          -
08          -
09          -
10          -
11          -
12          -
13          -
14          -
15          17h 0m 58s
16          -
```

```
show interface adsl {<port> | <port-range> | all} opstate
```

Summary Displays the ADSL operational state of ports on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters {<port> / <port-range> / all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

Description This command displays the operational state for the ADSL Transceiver Unit Central Office-side (ATU-C) associated with a single port or a range of ports.

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```

BASR# show interface adsl 1-6 opstate
Port  Description  OpState
-----
01          data
02          data
03    handshake
04    handshake
05    handshake
06    handshake

```

Command Output The following data is displayed:

Port	The port index.
OpState	The ADSL operational state of the interface, as determined by the ATU-C: IDLE (in idle mode); DATA (passing data); DMT BOOTUP LOAD (untimed boot-up load); HANDSHAKE (start-up handshake in progress); TRAINING (start-up training and exchange in progress); DMT FRAMER SYNC (framer synchronization in progress); DMT FAST RETRAIN IN PROGRESS (fast retrain in progress); DMT LL TEST (local analog loopback test in progress); DMT DL TEST (local digital loopback test in progress); DMT TX TEST (Spectrum test in progress); or DMT ATM LP TEST (ATM loopback test in progress).

```
show interface adsl {<port> | <port-range> | all} rates [ds | us]
```

Summary Displays the current transmission rate of ports on the BAS in the upstream and downstream directions.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters {<port> / <port-range> / all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

ds / us

This optional flag allows only downstream (DS) or upstream (US) rates to be displayed.

Description This command displays the upstream and downstream transmission speed for the specified port(s), and the channel in use.

Example

```

BASR# show interface adsl 1-5 rates
Port  Description  f/i  DS Rate  US Rate
-----
01          i    24.325M  1.088M
02          i    21.805M  1.088M
03          -      -      -
04          -      -      -
05          -      -      -

BASR# show interface adsl 16 rates us
Port  Description  US Rate
-----
16          1.020M

```

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Command Output The following data is displayed:

Port	The port index.
f/i	An indicator of the provisioned channel: fast (f) or interleaved (i).
DS Rate	The downstream transmission rate of the associated port, in megabits per second (M)
US Rate	The upstream transmission rate of the associated port, in megabits per second (M)

```
show interface adsl {<port> | <port-range> | all} inp
```

Summary Displays the number of Impulse Noise Protection (INP) symbols for ports on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters {<port> / <port-range> / all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

Description This command displays the Impulse Noise Protection symbols for the downstream interleaved channel. INP is only relevant for ADSL2/2+ when the BAS is operating in seamless rate adaptation (SRA) mode.

INP is always 0 for the fast channel, and INP is ignored when the BAS is operating in fixed rate mode (SRA disabled).

Example

```
BAS_10.11.4.3# show interface adsl 1-5 inp
Port Description f/i Inp
-----
01                i  0.520
02                i  0.199
03                -
04                -
05                -
```

Command Output The following data is displayed:

Port	The port index.
f/i	An indicator of the provisioned channel: fast (f) or interleaved (i).
DS Rate	The actual number of Impulse Noise Protection (INP) symbols for the downstream (ATU-C) interleaved channel. One symbol equals 250 microseconds, so an INP of 1 correlates to a correction time of 250 microseconds. Note that this generally displays as a fractional value.

```
adsllinealarmconfprofiletable adsllinealarmcountersreset {true | false}
```

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ADSL Monitoring Commands

Summary Enables reset of performance counters for the specified line during BAS runtime.



TIP: This can also be accomplished by a convenience command as described in “clearpm” on page 6-129

Required Mode Interface Config

User Entered Parameters *{true / false}*

True indicates that performance counters are cleared when the command is executed. This after this value has been set, it remains displayed as “true” when the adsllinealarmconfprofiletable is displayed via a “show” command. This does not mean that the counters have just been reset; it simply indicates that this was the last value set by the user.

The value can be set to “false” to indicate that the counters have previously been cleared, but have been actively gathered since the last time the command was run.

Description This command enables reset of performance counters during runtime. When this parameter is set to “true”, *all* line and channel performance counters are cleared in the following tables:

- adslAtucPerfDataTable
- adslAturPerfDataTable
- adslAtucIntervalTable
- adslAturIntervalTable
- adslAtucChanPerfDataTable
- adslAturChanPerfDataTable
- adslAtucChanIntervalTable
- adslAturChanIntervalTable
- adslAtucTraps
- adslAturTraps
- adslAtucPerfDataExtTable
- adslAtucIntervalExtTable
- adslAturPerfDataExtTable
- adslAturIntervalExtTable
- adslExtAtucTraps
- adslExtAturTraps

“no” form None

Defaults false

Example

```
BASR(config-if)# adsllinealarmconfprofiletable adsllinealarmcountersreset true
```


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Related Commands

- show interface adsl {<port>} adslalarmconfprofiletable on page 6-29
- show interface adsl {<port>} adslatucintervalextable on page 6-95
- show interface adsl {<port>} adslatucintervaltable on page 6-96
- show interface adsl {<port>} adslatucperfdatabl on page 6-97
- show interface adsl {<port>} adslatucperfdatabl on page 6-99
- show interface adsl {<port>} adslatucperfdatabl on page 6-104
- show interface adsl {<port>} adslaturintervalextable on page 6-106
- show interface adsl {<port>} adslaturintervaltable on page 6-106
- show interface adsl {<port>} adslaturperfdatabl on page 6-107
- show interface adsl {<port>} adslaturperfdatabl on page 6-109
- show interface adsl {<port>} adslaturperfdatabl on page 6-112
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-130
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-131
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-135
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-136
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-137
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-141

clearpm

Summary Clears all performance monitoring (PM) statistics.

Required Mode Interface Config

User Entered Parameters None.

Description This command clears all monitoring data taken from the ATU-C or ATU-R Performance Data Table and Fast/Interleaved Channel Performance Data Table.

“no” Form no clearpm
The “no” form of the command restores statistical information to the registers.

Defaults None

Example

```
BASR(config-if)# clearpm
```

Related Commands

- show interface adsl {<port>} pm {atu-c | atu-r} on page 6-116
- show interface adsl {<port>} pm interval {atu-c | atu-r} <all | hh:mm> on page 6-119
- show interface adsl {<port> | <port-range> | all} pm summary on page 6-122
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-137
- show interface adsl {<port>} adslaturperfdatabl {fast | interleaved} on page 6-131

6.14 Channel Display Commands

6.14

Channel Display Commands

```
show interface adsl {<port>} adslatucchanintervaltable {fast | interleaved}
```

Summary Show the ATU-C interval statistics for the port's channel(s).

Required Mode Global Config

User-Entered *<port>*

Parameters The *<port>* parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

{fast | interleaved}

The type of ADSL channel on the specified port that the show command will display the statistics for.

Description This command presents the contents of the selected ADSL port's ATU-R channel interval table. This table provides information about the number and type of blocks received from the channel by the remote ADSL Transceiver Unit, the count of corrected and uncorrectable blocks received, and the number of Cell Delineation and Header errors observed on the channel. The information shown in the table applies to the most recent 15 minute monitoring time interval for the ATU-R.

Example

```
BASR# show interface adsl 17 adslatucchanintervaltable interleaved
Port 17
adslatucchanintervaltable (interleaved):
adslAtucChanIntervalNumber:          1
adslAtucChanIntervalReceivedBlks:    49500
adslAtucChanIntervalTransmittedBlks: 54900
adslAtucChanIntervalCorrectedBlks:   112
adslAtucChanIntervalUncorrectBlks:    0
adslAtucChanIntervalValidData:       1
adslAtucChanIntervalTimeElapsed:     900
adslAtucChanIntervalNcd:              0
adslAtucChanIntervalOcd:              0
adslAtucChanIntervalHec:              0
adslAtucChanIntervalNcds:             0
adslAtucChanIntervalLcds:             0
```

Command Output: The following information is contained in the ATU-C channel interval table:

adslAtucChanIntervalNumber	The sequence number (from 1 to 96) of the 15 minute monitoring time interval that the displayed statistics are from. A value of 1 indicates the most recent complete monitoring interval, while a value of 96 indicates the interval completed 24 hours ago.
adslAtucChanIntervalReceivedBlks	Count of all encoded blocks received on this channel during the currently displayed monitoring interval.
adslAtucChanIntervalTransmitted Blks	Count of all encoded blocks transmitted from this channel during the currently displayed monitoring interval.
adslAtucChanIntervalCorrected Blks	Number of blocks received with correctable errors. These blocks were treated as valid blocks after the BAS corrected the error(s).

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adslAtucChanIntervalUncorrect Blks	Count of blocks received on this channel containing errors that could not be corrected.
adslAtucChanIntervalValidData	Indicates if the data displayed for this monitoring time interval should be considered valid (0x1) or invalid (0x0).
adslAtucChanIntervalTimeElapsed	Elapsed seconds in the current time interval.
adslAtucChanIntervalNcd	Number of No Cell Delineation errors noted on the channel during the currently displayed time interval.
adslAtucChanIntervalOcd	Number of Out Of Cell (OCD) events noted on the channel during the currently displayed time interval.
adslAtucChanIntervalHec	Number of times during the currently displayed time interval that a Header Error Check error was noted on the channel.

```
show interface adsl {<port>} adslatucchanperfdatabl {fast | interleaved}
```

Summary Show the collected performance statistics for the port's ATU-C channel interface.

Required Mode Global Config

User-Entered *<port>*

Parameters The <port> parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

{fast / interleaved}

The type of ADSL channel on the specified port that the show command will display the statistics for.

Description This command shows the contents of the selected ADSL port's ATU-C channel Performance Data table. The information in this table describes the operational characteristics and performance of the channel, including channel uptime, error conditions, and data transmitted or received.

Example**6.14***Channel Display
Commands*

```

BASR# show interface adsl 17 adslatucchanperfdatatable interleaved
Port 17
adslatucchanperfdatatable (interleaved):
  adslAtucChanReceivedBlks:          243375
  adslAtucChanTransmittedBlks:       269925
  adslAtucChanCorrectedBlks:         920
  adslAtucChanUncorrectBlks:         0
  adslAtucChanPerfValidIntervals:    5
  adslAtucChanPerfInvalidIntervals:  91
  adslAtucChanPerfCurr15MinTimeElapsed: 160
  adslAtucChanPerfCurr15MinReceivedBlks: 8800
  adslAtucChanPerfCurr15MinTransmittedBlks: 9760
  adslAtucChanPerfCurr15MinCorrectedBlks: 8
  adslAtucChanPerfCurr15MinUncorrectBlks: 0
  adslAtucChanPerfCurr1DayTimeElapsed: 4488
  adslAtucChanPerfCurr1DayReceivedBlks: 243375
  adslAtucChanPerfCurr1DayTransmittedBlks: 269925
  adslAtucChanPerfCurr1DayCorrectedBlks: 920
  adslAtucChanPerfCurr1DayUncorrectBlks: 0
  adslAtucChanPerfPrev1DayMoniSecs: 0
  adslAtucChanPerfPrev1DayReceivedBlks: 0
  adslAtucChanPerfPrev1DayTransmittedBlks: 0
  adslAtucChanPerfPrev1DayCorrectedBlks: 0
  adslAtucChanPerfPrev1DayUncorrectBlks: 0
  adslAtucChanPerfTimeElapsed:       4488
  adslAtucChanPerfNcd:               0
  adslAtucChanPerfOcd:               0
  adslAtucChanPerfHec:               0
  adslAtucChanPerfCurr15MinNcd:       0
  adslAtucChanPerfCurr15MinOcd:       0
  adslAtucChanPerfCurr15MinHec:       0
  adslAtucChanPerfCurr1DayNcd:        0
  adslAtucChanPerfCurr1DayOcd:        0
  adslAtucChanPerfCurr1DayHec:        0
  adslAtucChanPerfPrev1DayNcd:        0
  adslAtucChanPerfPrev1DayOcd:        0
  adslAtucChanPerfPrev1DayHec:        0
  adslAtucChanPerfValid1DayIntervals: 0
  adslAtucChanPerfInvalid1DayIntervals: 1
  adslAtucChanPerfNcds:               0
  adslAtucChanPerfLcds:               0
  adslAtucChanPerfCurr15MinNcds:      0
  adslAtucChanPerfCurr15MinLcds:      0
  adslAtucChanPerfCurr1DayNcds:       0
  adslAtucChanPerfCurr1DayLcds:       0
  adslAtucChanPerfPrev1DayNcds:       0
  adslAtucChanPerfPrev1DayLcds:       0

```

Command Output: The following information is shown in the ATU-C channel performance data table:

adslAtucChanReceivedBlk	Count of all encoded blocks received on this interface since last reset and initialization.
adslAtucChanTransmittedBlks	Count of all encoded blocks transmitted from this interface since the previous reset.
adslAtucChanCorrectedBlks	Number of blocks received with correctable errors. These blocks were treated as valid blocks after the BAS corrected the error(s).

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adslAtucChanUncorrectBlks	Count of blocks received on this interface containing errors that could not be corrected.
adslAtucChanPerfValidIntervals	Number of 15 minute time intervals for which performance data was collected by the BASR.
adslAtucChanPerfInvalidIntervals	Number of 15 minute time intervals for which data could not be collected.
adslAtucChanPerfCurr15MinTimeElapsed	Number of seconds that have elapsed in the current 15 minute monitoring time interval.
adslAtucChanPerfCurr15MinReceivedBlks	Number of blocks of data received during the current 15 minute time interval.
adslAtucChanPerfCurr15MinTransmittedBlks	Number of blocks transmitted by the interface in the current 15 minute time interval.
adslAtucChanPerfCurr15MinCorrectedBlks	Count of blocks received in the current 15 minute time interval containing correctable errors.
adslAtucChanPerfCurr15MinUncorrectBlks	Number of blocks received in the current 15 minute time interval containing errors that could not be corrected.
adslAtucChanPerfCurr1DayTimeElapsed	Number of seconds elapsed since the beginning of the current 1 day monitoring time interval.
adslAtucChanPerfCurr1DayReceivedBlks	Number of blocks of data received during the current 1 day time interval.
adslAtucChanPerfCurr1DayTransmittedBlks	Number of blocks transmitted by the interface in the current 1 day time interval.
adslAtucChanPerfCurr1DayCorrectedBlks	Count of blocks received in the current 1 day time interval containing correctable errors.
adslAtucChanPerfCurr1DayUncorrectBlks	Number of blocks received in the current 1 day time interval containing errors that could not be corrected.
adslAtucChanPerfPrev1DayMoniSecs	Number of seconds in the previous (most recently completed) full 1 day time interval for which monitoring statistics were collected.
adslAtucChanPerfPrev1DayReceivedBlks	Number of blocks of data received during the previous 1 day time interval.
adslAtucChanPerfPrev1DayTransmittedBlks	Number of blocks transmitted by the interface in the previous 1 day time interval.
adslAtucChanPerfPrev1DayCorrectedBlks	Count of blocks received in the previous 1 day time interval containing correctable errors.
adslAtucChanPerfPrev1DayUncorrectBlks	Number of blocks received in the previous 1 day time interval containing errors that could not be corrected.
adslAtucChanPerfTimeElapsed	Elapsed seconds in the current time interval.
adslAtucChanPerfNcd	Number of No Cell Delineation (NCD) errors noted on this interface.
adslAtucChanPerfOcd	Number of Out Of Cell (OCD) events recorded on this interface.
adslAtucChanPerfHec	Header Error Check (HEC) operations performed on this interface.

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adslAtucChanPerfCurr15MinNcd	Number of No Cell Delineation (NCD) errors noted on this interface during the current 15 minute time interval.
adslAtucChanPerfCurr15MinOcd	Number of Out Of Cell (OCD) events recorded on this interface during the current 15 minute time interval.
adslAtucChanPerfCurr15MinHec	Header Error Check (HEC) operations performed on this interface during the current 15 minute time interval.
adslAtucChanPerfCurr1DayNcd	Number of No Cell Delineation (NCD) errors noted on this interface during the current 1 day time interval.
adslAtucChanPerfCurr1DayOcd	Number of Out Of Cell (OCD) events recorded on this interface during the current 1 day time interval.
adslAtucChanPerfCurr1DayHec	Header Error Check (HEC) operations performed on this interface during the current 1 day time interval.
adslAtucChanPerfPrev1DayNcd	Number of No Cell Delineation (NCD) errors noted on this interface during the previous (completed) 1 day time interval.
adslAtucChanPerfPrev1DayOcd	Number of Out Of Cell (OCD) events recorded on this interface during the previous (completed) 1 day time interval.
adslAtucChanPerfPrev1DayHec	Header Error Check (HEC) operations performed on this interface during the previous (completed) 1 day time interval.
adslAtucChanPerfValid1DayIntervals	The number of previous 1-Day intervals in the interval table for which data was collected.
adslAtucChanPerfInvalid1DayIntervals	The number of intervals in the range from 0 to the value of "adslAtucChanPerfValid1DayIntervals" for which no data is available. This object will typically be zero except in cases where the data for some intervals are not available (e.g., in proxy situations).
adslAtucChanPerfNcds	Count of all blocks received with no cell delineation (NCD) failures since agent reset. An NCD failure is declared when an NCD defect is present for 2- 3 seconds after SHOWTIME.
adslAtucChanPerfLcds	Count of all blocks received with loss of cell delineation (LCD) failures since agent reset. An LCD failure is declared when an LCD defect persists for more than 2 - 3 seconds.
adslAtucChanPerfCurr15MinNcds	Count of all blocks received with no cell delineation (NCD) failures during the current 15 minute interval.
adslAtucChanPerfCurr15MinLcds	Count of all blocks received with loss of cell delineation (LCD) failures during the current 15 minute interval.
adslAtucChanPerfCurr1DayNcds	Count of all blocks received with no cell delineation (NCD) failures during the current day as measured by "adslAtucChanPerfCurr1DayTimeElapsed".

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adslAtucChanPerfCurr1DayLcds	Count of all blocks received with loss of cell delineation (LCD) failures during the current day as measured by "adslAtucChanPerfCurr1DayTimeElapsed".
adslAtucChanPerfPrev1DayNcds	Count of all blocks received with no cell delineation (NCD) failures within the most recent previous 1-day period.
adslAtucChanPerfPrev1DayLcds	Count of all blocks received with loss of cell delineation (LCD) failures within the most recent previous 1-day period.

```
show interface adsl {<port>} adslatucchantable {fast | interleaved}
```

Summary Display the operational settings of the selected port's ATU-C channel(s).

Required Mode Global Config

User-Entered *<port>*

Parameters The number of an ADSL port on the BAS identifying a single ADSL line.

{fast | interleaved}

The type of ADSL channel on the specified port that the show command will display the statistics for.

Description This command shows the table of configuration settings of the ADSL Transceiver Unit Central Office side, or ATU-C. This information shows the current configured and negotiated settings for the ATU-C's ADSL channel(s).

Example

```
BASR# show interface adsl 17 adslatucchantable interleaved
Port 17
adslatucchantable (interleaved):
adslAtucChanInterleaveDelay: 4
adslAtucChanCurrTxRate:      22986208
adslAtucChanPrevTxRate:      0
adslAtucChanCrcBlockLength:  44075
adslAtucChanCurrAtmStatus:    noAtmDefect
adslAtucChanRsSymbols:        30
adslAtucChanRsDepth:          64
adslAtucChanRsRedundancy:      4
adslAtucChanLOdn:              5424
adslAtucChanMOdn:              1
adslAtucChanTOdn:              5
adslAtucChanBOdn:              200
adslAtucChanPerfAtmCD:         16121513
adslAtucChanPerfAtmCU:         4283
adslAtucChanINPdn:             18
```

Command Output: The following information is shown in the BAS ADSL ATU-C channel table:

adslAtucChanInterleaveDelay	The interleaving delay mapping (in microseconds) applied between bytes in the channel's bit stream.
adslAtucChanCurrTxRate	Observed (actual) transmit rate of the channel.

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adslAtucChanPrevTxRate	Transmit rate recorded at the interface's last change of rate (rate change alarm generation) or initialization.
adslAtucChanCrcBlockLength	Length of the Cyclic Redundancy Check data block for the channel.
adslAtucChanCurrAtmStatus	Status of the interface's No Cell Delineation and Loss of Cell Delineation (NCD/LCD) counters. This field will display "noAtmDefect" if the NCD and LCD counters remain below the 127 error threshold.
adslAtucChanRsSymbols	Number of symbols (S value) per Reed-Solomon code word in the downstream bit stream.
adslAtucChanRsDepth	Measure of the interleaving depth (D value) in the downstream bit stream.
adslAtucChanRsRedundancy	Number of redundant bytes (R value) per Reed-Solomon code word in the downstream bit stream.
adslAtucChanL0dn	Number of bits from the upstream latency path function #0 included per DMT symbol (supported for ADSL2/2+ only).
adslAtucChanM0dn	Number of Mux Data Frames per FEC Data Frame in upstream latency path function #0 (supported for ADSL2/2+ only).
adslAtucChanT0dn	Ratio of the number of Mux Data Frames to the number of sync octets in the upstream latency path function #0 (supported for ADSL2/2+ only).
adslAtucChanB0dn	Nominal number of octets from frame bearer #0 per Mux Data Frame at Reference Point A in upstream latency path function #0 (supported for ADSL2/2+ only).
adslAtucChanPerfAtmCD	The total number of cells passed through the cell delineation and HEC function process operating on the ATM Data Path while in the SYNC state.
adslAtucChanPerfAtmCU	The total number of cells in the ATM Data Path delivered at the logical interface between the ATU-C and a digital network element, such as one or more switching systems.
adslAtucChanINPdn	The actual number of Impulse Noise Protection (INP) symbols for the downstream interleaved channel.

```
show interface adsl {<port>} adslaturchanintervaltable {fast | interleaved}
```

Summary Show the ATU-R interval statistics for the port's channel(s).

Required Mode Global Config

User-Entered Parameters *<port>*

The *<port>* parameter is the number of an ADSL port on the BAS identifying a single ADSL line.

{fast | interleaved}

The type of ADSL channel on the specified port that the show command will display the statistics for.

Description This command presents the contents of the selected ADSL port's ATU-R channel interval table. This table provides information about the number and type of blocks received from the channel by the remote ADSL Transceiver Unit, the count of corrected and uncorrectable blocks received, and the number of Cell Delineation and

Header errors observed on the channel. The information shown in the table applies to the most recent 15 minute monitoring time interval for the ATU-R.

Example

```
BASR# show interface adsl 17 adslaturchanintervaltable interleaved
Port 17
adslaturchanintervaltable (interleaved):
  adslAturChanIntervalNumber:      1
  adslAturChanIntervalReceivedBlks: 54900
  adslAturChanIntervalTransmittedBlks: 49500
  adslAturChanIntervalCorrectedBlks: 334
  adslAturChanIntervalUncorrectBlks: 0
  adslAturChanIntervalValidData:    1
  adslAturChanIntervalNcd:          0
  adslAturChanIntervalHec:          0
  adslAturChanIntervalNcds:         0
  adslAturChanIntervalLcds:         0
```

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Command Output: The following information is contained in the ATU-R channel interval table:

adslAturChanIntervalNumber	The sequence number (from 1 to 96) of the 15 minute monitoring time interval that the displayed statistics are from. A value of 1 indicates the most recent complete monitoring interval, while a value of 96 indicates the interval completed 24 hours ago.
adslAturChanIntervalReceivedBlks	Count of all encoded blocks received on this channel during the currently displayed monitoring interval.
adslAturChanIntervalTransmitted Blks	Count of all encoded blocks transmitted from this channel during the currently displayed monitoring interval.
adslAturChanIntervalCorrected Blks	Number of blocks received with correctable errors. These blocks were treated as valid blocks after the BAS corrected the error(s).
adslAturChanIntervalUncorrect Blks	Count of blocks received on this channel containing errors that could not be corrected.
adslAturChanIntervalValidData	Indicates if the data displayed for this monitoring time interval should be considered valid (0x1) or invalid (0x0).
adslAturChanIntervalNcd	Number of No Cell Delineation errors noted on the channel during the currently displayed time interval.
adslAturChanIntervalHec	Number of times during the currently displayed time interval that a Header Error Check error was noted on the channel.

```
show interface adsl {<port>} adslaturchanperfdatatable {fast | interleaved}
```

Summary Show performance information for the selected channel.

Required Mode Global Config

User-Entered Parameters <port>

The <port> parameter is the number of an ADSL port identifying a single ADSL line.

{fast / interleaved}

The type of ADSL channel on the specified port that the show command will display the statistics for.

Description This command shows the contents of the selected ADSL port's ATU-R channel Performance Data table. The information in this table describes the operational characteristics and performance of the channel, including channel uptime, error conditions, and data transmitted or received.

Example

```
BASR# show interface adsl 17 adslaturchanperfdatatable interleaved
Port 17
adslaturchanperfdatatable (interleaved):
  adslAturChanReceivedBlks:          366488
  adslAturChanTransmittedBlks:       330440
  adslAturChanCorrectedBlks:         3304
  adslAturChanUncorrectBlks:          4
  adslAturChanPerfValidIntervals:     6
  adslAturChanPerfInvalidIntervals:   90
  adslAturChanPerfCurr15MinTimeElapsed: 843
  adslAturChanPerfCurr15MinReceivedBlks: 51423
  adslAturChanPerfCurr15MinTransmittedBlks: 46365
  adslAturChanPerfCurr15MinCorrectedBlks: 352
  adslAturChanPerfCurr15MinUncorrectBlks: 0
  adslAturChanPerfCurr1DayTimeElapsed: 6071
  adslAturChanPerfCurr1DayReceivedBlks: 366488
  adslAturChanPerfCurr1DayTransmittedBlks: 330440
  adslAturChanPerfCurr1DayCorrectedBlks: 3304
  adslAturChanPerfCurr1DayUncorrectBlks: 4
  adslAturChanPerfPrev1DayMoniSecs:    0
  adslAturChanPerfPrev1DayReceivedBlks: 0
  adslAturChanPerfPrev1DayTransmittedBlks: 0
  adslAturChanPerfPrev1DayCorrectedBlks: 0
  adslAturChanPerfPrev1DayUncorrectBlks: 0
  adslAturChanPerfNcd:                 0
  adslAturChanPerfHec:                 0
  adslAturChanPerfCurr15MinNcd:        0
  adslAturChanPerfCurr15MinHec:        0
  adslAturChanPerfCurr1DayNcd:         0
  adslAturChanPerfCurr1DayHec:         0
  adslAturChanPerfPrev1DayNcd:         0
  adslAturChanPerfPrev1DayHec:         0
  adslAturChanPerfValid1DayIntervals:  0
  adslAturChanPerfInvalid1DayIntervals: 1
  adslAturChanPerfNcds:                0
  adslAturChanPerfLcds:                0
  adslAturChanPerfCurr15MinNcds:       0
  adslAturChanPerfCurr15MinLcds:       0
  adslAturChanPerfCurr1DayNcds:        0
  adslAturChanPerfCurr1DayLcds:        0
  adslAturChanPerfPrev1DayNcds:        0
  adslAturChanPerfPrev1DayLcds:        0
```

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Channel Display Commands

Command Output: The following information is shown in the channel Performance Data table:

adslAturChanReceivedBlks	Count of all encoded blocks received on this channel since the most recent reset or initialization.
adslAturChanTransmittedBlks	Count of all encoded blocks transmitted from this channel since the last reset.
adslAturChanCorrectedBlks	Number of blocks received with correctable errors. These blocks were treated as valid blocks after the BAS corrected the error(s).
adslAturChanUncorrectBlks	Count of blocks received on this channel containing errors that could not be corrected.
adslAturChanPerfValidIntervals	Number of 15 minute monitoring intervals for which valid performance data was corrected.
adslAturChanPerfInvalidIntervals	Count of the 15 minute time intervals for which no performance data is available.
adslAturChanPerfCurr15MinTime Elapsed	Number of seconds that have elapsed since the start of the current 15 minute time interval.
adslAturChanPerfCurr15MinReceived Blks	Number of encoded blocks received by the channel in the current 15 minute time interval.
adslAturChanPerfCurr15MinTransmitted Blks	Number of blocks transmitted to the channel during the current 15 minute time interval.
adslAturChanPerfCurr15MinCorrected Blks	Number of blocks received with correctable errors in the current 15 minute time interval.
adslAturChanPerfCurr15MinUncorrect Blks	Number of blocks received in the current 15 minute time interval with uncorrectable errors.
adslAturChanPerfCurr1DayTimeElapsed	Number of seconds that have elapsed in the current 1 day monitoring time interval.
adslAturChanPerfCurr1DayReceived Blks	Number of encoded blocks received by the channel in the current 1 day time interval.
adslAturChanPerfCurr1DayTransmitted Blks	Number of blocks transmitted to the channel during the current 1 day time interval.
adslAturChanPerfCurr1DayCorrected Blks	Number of blocks received with correctable errors in the current 1 day time interval.
adslAturChanPerfCurr1DayUncorrect Blks	Number of blocks received in the current 1 day time interval with uncorrectable errors.
adslAturChanPerfPrev1DayMoniSecs	Amount of time (in seconds) during the previous 1 day time interval that statistics were gathered on the ATU.
adslAturChanPerfPrev1DayReceived Blks	Number of encoded blocks received by the channel in the previous 1 day time interval.
adslAturChanPerfPrev1DayTransmitted Blks	Number of blocks transmitted to the channel during the previous 1 day time interval.
adslAturChanPerfPrev1DayCorrected Blks	Number of blocks received with correctable errors in the previous 1 day time interval.
adslAturChanPerfPrev1DayUncorrect Blks	Number of blocks received in the previous 1 day time interval with uncorrectable errors.
adslAturChanPerfNcd	Number of No Cell Delineation errors observed on the channel since the last initialization.

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adslAturChanPerfHec	Count of Header Error Check errors recorded for this channel since the last initialization.
adslAturChanPerfCurr15MinNcd	Number of No Cell Delineation errors observed on the channel in the current 15 minute monitoring time interval.
adslAturChanPerfCurr15MinHec	Number of Header Error Check errors for this channel recorded in the current 15 minute monitoring time interval.
adslAturChanPerfCurr1DayNcd	Number of No Cell Delineation errors counted on the channel in the current 1 day time interval.
adslAturChanPerfCurr1DayHec	Number of Header Error Check events on this channel in the current 1 day time interval.
adslAturChanPerfPrev1DayNcd	Number of No Cell Delineation errors recorded on this channel during the previous completed 1 day interval.
adslAturChanPerfPrev1DayHec	The count of Header Error Check errors for this channel in the previous 1 day time interval.
adslAturChanPerfValid1DayIntervals	The number of previous 1-Day intervals in the interval table for which data was collected.
adslAturChanPerfInvalid1DayIntervals	The number of intervals in the range from 0 to the value of "adslAturChanPerfValid1DayIntervals" for which no data is available. This object will typically be zero except in cases where the data for some intervals are not available (e.g., in proxy situations).
adslAturChanPerfNcds	Count of all blocks received with no cell delineation (NCD) failures since agent reset. An NCD failure is declared when an NCD defect is present for 2- 3 seconds after SHOWTIME.
adslAturChanPerfLcds	Count of all blocks received with loss of cell delineation (LCD) failures since agent reset. An LCD failure is declared when an LCD defect persists for more than 2 - 3 seconds.
adslAturChanPerfCurr15MinNcds	Count of all blocks received with no cell delineation (NCD) failures during the current 15 minute interval.
adslAturChanPerfCurr15MinLcds	Count of all blocks received with loss of cell delineation (LCD) failures during the current 15 minute interval.
adslAturChanPerfCurr1DayNcds	Count of all blocks received with no cell delineation (NCD) failures during the current day as measured by "adslAturChanPerfCurr1DayTimeElapsed".
adslAturChanPerfCurr1DayLcds	Count of all blocks received with loss of cell delineation (LCD) failures during the current day as measured by "adslAturChanPerfCurr1DayTimeElapsed".
adslAturChanPerfPrev1DayNcds	Count of all blocks received with no cell delineation (NCD) failures within the most recent previous 1-day period.
adslAturChanPerfPrev1DayLcds	Count of all blocks received with loss of cell delineation (LCD) failures within the most recent previous 1-day period.

```
show interface adsl {<port>} adslaturchantable {fast | interleaved}
```

Summary Display the operational settings of the selected port's ATU-R channel(s).

Required Mode Global Config

User-Entered *<port>*

Parameters The <port> parameter is the number of an ADSL port identifying a single ADSL line.

{fast / interleaved}

The type of ADSL channel on the specified port that the show command will display the statistics for.

Description This command shows the table of configuration settings of the ADSL Transceiver Unit Remote side, or ATU-R. This information shows the current configured and negotiated settings for the ATU-R's ADSL channel(s).

Example

```
BASR# show interface adsl 17 adslaturchantable interleaved
Port 17
adslaturchantable (interleaved):
adslAturChanInterleaveDelay: 12
adslAturChanCurrTxRate:      1216000
adslAturChanPrevTxRate:      0
adslAturChanCrcBlockLength:  2914
adslAturChanCurrAtmStatus:    noAtmDefect
adslAturChanRsSymbols:        608
adslAturChanRsDepth:          8
adslAturChanRsRedundancy:      16
adslAturChanLOup:              326
adslAturChanMOup:              8
adslAturChanTOup:              1
adslAturChanBOup:              28
adslAturChanPerfAtmCD:         331265067
adslAturChanPerfAtmCU:         53366333
adslAturChanINPup:             157
```

Command Output: The following information is presented in the ATU-R Channel table:

adslAturChanInterleaveDelay	The interleaving delay mapping (in microseconds) applied between bytes in the channel's bit stream.
adslAturChanCurrTxRate	Observed (actual) transmit rate of the channel.
adslAturChanPrevTxRate	Transmit rate recorded at the interface's last change of rate (rate change alarm generation) or initialization.
adslAturChanCrcBlockLength	Length of the Cyclic Redundancy Check data block for the channel.
adslAturChanCurrAtmStatus	Status of the interface's No Cell Delineation and Loss of Cell Delineation (NCD/LCD) counters. This field will display "noAtmDefect" if the NCD and LCD counters remain below the 127 error threshold.
adslAturChanRsSymbols	Number of symbols (S value) per Reed-Solomon code word in the downstream bit stream.

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adslAturChanRsDepth	Measure of the interleaving depth (D value) in the downstream bit stream.
adslAturChanRsRedundancy	Number of redundant Bytes (R value) per Reed-Solomon code word in the downstream bit stream.
adslAturChanL0dn	Number of bits from the upstream latency path function #0 included per DMT symbol (supported for ADSL2/2+ only).
adslAturChanM0dn	Number of Mux Data Frames per FEC Data Frame in upstream latency path function #0 (supported for ADSL2/2+ only).
adslAturChanT0dn	Ratio of the number of Mux Data Frames to the number of sync octets in the upstream latency path function #0 (supported for ADSL2/2+ only).
adslAturChanB0dn	Nominal number of octets from frame bearer #0 per Mux Data Frame at Reference Point A in upstream latency path function #0 (supported for ADSL2/2+ only).
adslAturChanPerfAtmCD	The total number of cells passed through the cell delineation and HEC function process operating on the ATM Data Path while in the SYNC state.
adslAturChanPerfAtmCU	The total number of cells in the ATM Data Path delivered at the logical interface between the ATU-C and a digital network element, such as one or more switching systems.
adslAturChanINPup	The actual number of Impulse Noise Protection (INP) symbols for the upstream interleaved channel.

6.15 ADSL Port Statistics Commands

The following commands display interface statistics for the ADSL ports.

```
show interface stats adsl {<port>}
```

Summary Displays ADSL statistics and information for the specified port(s).

Required Mode Privileged Exec

User Entered *<port>*

Parameters Selects the ADSL port for which to display statistics.

Description Displays various ADSL statistics and configuration information for an ADSL port.

Example

```

BASR# show interface stats adsl 17
ADSL Port 17:
AdminState:          UP
AtucOpState:         DATA
AtucActualStandard:  adsl2+
LineTransAtucActual: q9925AnnexADSL2PlusPotsOverlapped
                    |ADSL2Plus|annex adsl2|ec  |
ATU-C Curr Status:   noDefect (0x1)
ATU-R Curr Status:   noDefect (0x1)
Line Type:           interleavedOnly
Data Boost Status:   enabled

                Downstream      Upstream
SNR Margin:      5.0dB          6.0dB
Attenuation:     21.3dB         0.0dB
Output Power:    16.3dBm        0.0dBm
Current Tx Rate: 23.761Mbps      1.216Mbps
Attainable Rate: 24.570Mbps      1.329Mbps
ATM Cell Count:  1101043275      125089
Interleave Delay: 4ms            12ms
S (RS Symbols):  0.29            6.06
INP:              0.182           1.565

```

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Command Output The following information is displayed.

AdminState	The current administrative state of the interface: up (operational), down (not initialized, or administratively disabled), or test (in some test state; no operational packets can be passed).
AtucOpState	The ADSL operational state of the interface, as determined by the ATU-C: IDLE (in idle mode); DATA (passing data); DMT BOOTUP LOAD (untimed boot-up load); HANDSHAKE (start-up handshake in progress); TRAINING (start-up training and exchange in progress); DMT FRAMER SYNC (framer synchronization in progress); DMT FAST RETRAIN IN PROGRESS (fast retrain in progress); DMT LL TEST (local analog loopback test in progress); DMT DL TEST (local digital loopback test in progress); DMT TX TEST (Spectrum test in progress); or DMT ATM LP TEST (ATM loopback test in progress).
AtucActualStandard	The actual standard used for the connection between the BAS and the CPE, based on the outcome of negotiation with the CPE. Possible values are: <ul style="list-style-type: none"> • t1_413 • g_dmt • g_lite • adsl2 • adsl2+ • readsl2

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Statistics
Commands

LineTransAtucActual	<p>The actual transmission mode of the BAS ATU. During ADSL line initialization, the remote ATU CPE determines the mode used for the link. The returned value shows all actual transmission modes supported (for example <i>g9922potsNonOverlapped g.lite annex a fdm </i>). This object returns a 0 if the mode is not known. This value is limited to a single transmission mode that is a subset of those modes enabled by the BASR. Possible returned values are:</p> <ul style="list-style-type: none"> • <i>ansit1413 t1.413 ----- ---</i> • <i>g9921PotsNonOverlapped g.dmt annex a fdm </i> • <i>g9921PotsNonOverlapped g.dmt annex a ec </i> • <i>g9922potsNonOverlapped g.lite annex a fdm </i> • <i>g9923annexADSL2PotsNonOverlapped ADSL2 annex adsl2 fdm </i> • <i>g9925annexADSL2PlusPotsOverlapped ADSL2 annex adsl2 ec </i> • <i>g9925annexADSL2PlusPotsNonOverlapped ADSL2 annex adsl2 fdm </i> • <i>g9923annexREADSL2PlusPotsNonOverlapped READSL2 annex adsl2 fdm </i>
Atu-C Curr Status	<p>The current state of the ADSL line at the CO (BASR) ADSL Termination Unit:</p> <ul style="list-style-type: none"> • <i>noDefect</i> – There are no error conditions on the line. • <i>lossOfFraming</i> – Failure due to not receiving valid frame. • <i>lossOfSignal</i> – Failure due to not receiving signal. • <i>lossOfPower</i> – Failure due to loss of power. • <i>lossOfSignalQuality</i> – Noise margin has fallen below minimum allowable noise margin, or the bit-error-rate (BER) has exceeded 10^{-7}. • <i>lossOfLink</i> – Failure due to inability to link with Remote (CPE) ADSL Termination Unit. • <i>dataInitFailure</i> – Failure during initialization due to bit errors corrupting start-up exchange data. • <i>configInitFailure</i> – Failure during initialization due to peer ATU not being able to support requested configuration. • <i>protocolInitFailure</i> – Failure during initialization due to incompatible protocol used by the peer ATU. • <i>noPeerAtuPresent</i> – Failure during initialization due to no activation sequence detected from peer ATU.
Atu-R Curr Status	<p>The current state of the the ATU-R line. Possible states are:</p> <ul style="list-style-type: none"> • <i>noDefect</i> - There are no defects on the line. • <i>lossOfFraming</i> – ATU-R failure due to not receiving valid frame. • <i>lossOfSignal</i> – ATU-R failure due to not receiving signal. • <i>lossOfPower</i> – ATU-R failure due to loss of power. • <i>lossOfSignalQuality</i> - Loss of signal quality is declared when the noise margin falls below the minimum noise margin, or the bit-error-rate exceeds 10^{-7}. <p>The following values are available if the port is in ADSL2/ADSL2plus DELT mode:</p> <ul style="list-style-type: none"> • <i>Success</i> – Last full initialization was successful • <i>FailedCrcError</i> – Last full initialization failed due to CRC error in one of the received messages • <i>FailedTimeOut</i> – Last full initialization failed because the time duration for a particular initialization state, as defined by G.992.3, was exceeded • <i>FailedUnknown</i> – Last full initialization failed, cause unknown
Line Type	The actual transmit rate on the downstream interleaved channel to the CPE (in bits per second).
Data Boost Status	Indicates whether the proprietary "data boost" feature is enabled or disabled for the connection. See "adslslineconfprofiletable adslatucconfdataboost {enable disable}" on page 6-36

The following information is displayed for both the ATU-C (local) and ATU-R (remote) end of the connection.

SNR Margin	The Noise Margin as seen by the ATU-C or ATU-R with respect to its received signal in tenth dB increments. This measurement is available for ADSL2/ADSL2+ only.
Attenuation	Line attenuation measurement available for ADSL2/ADSL2+ only. <ul style="list-style-type: none"> • ATU-C – Upstream line attenuation. The measured difference in dB in the total power transmitted by the ATU-R and the total power received by the ATU-C over all sub-carriers during diagnostics mode and initialization. • ATU-R – Downstream line attenuation. The measured difference in dB in the total power transmitted by the ATU-C and the total power received by the ATU-R over all sub-carriers during diagnostics mode and initialization.
Output Power	The measured total output power transmitted by the ATU-C (in dBm). This is the measurement that was reported during the last activation sequence. Output power is not measured for the ATU-R, and will always indicate 0.0 dBm. <ul style="list-style-type: none"> • For ADSL operation, this measurement includes Gi cutback (gain scaling). • For ADSL2/2+ operation, this measurement does not include Gi cutback (gain scaling).
Current Tx Rate	Transmission rate: <ul style="list-style-type: none"> • ATU-C – The actual transmit rate on the downstream fast or interleaved channel to the CPE (in bits per second). • ATU-R – The actual transmit rate on the upstream fast or interleaved channel from the CPE (in bits per second).
Attainable Rate	Maximum attainable rate (available for ADSL2/ADSL2+ only): <ul style="list-style-type: none"> • ATU-C – The maximum downstream net data rate, in bits/s, currently attainable by the ATU-C transmitter and the ATU-R receiver. • ATU-R – The maximum upstream net data rate, in bits/s, currently attainable by the ATU-R transmitter and the ATU-C receiver.
ATM Cell Count	ATU-C – The number of ATM cells transmitted by the BAS since system initialization or since counters were last reset. This is a 32-bit counter that rolls over at 4,294,967,295. ATU-R – The number of ATM cells received by the BAS since system initialization or since counters were last reset. This is a 32-bit counter that rolls over at 4,294,967,295.
Interleave Delay	Interleave delay for this channel in milliseconds (applicable to ATU-C and ATU-R interleaved channel only). Interleave delay defines the mapping (relative spacing) between subsequent input bytes at the interleaver input and their placement in the bit stream at the interleaver output. Larger numbers provide greater separation between consecutive input bytes in the output bit stream allowing for improved impulse noise immunity at the expense of payload latency.
S (RS Symbols)	The number of DMT symbols per RS (Reed-Solomon) code word (S) in the upstream direction (ATU-R) or downstream (ATU-C) direction.
INP	The actual number of Impulse Noise Protection (INP) symbols for the upstream (ATU-R) or downstream (ATU-C) interleaved channel. One symbol equals 250 microseconds, so an INP of 1 correlates to a correction time of 250 microseconds. Note that this generally displays as a fractional value.

6.15

ADSL Port Statistics Commands

6.16

Configuring
ADSL2/2+
Downstream
Seamless Rate
Adaptation

6.16 Configuring ADSL2/2+ Downstream Seamless Rate Adaptation

Seamless rate adaptation (SRA), a key feature of ADSL2/2+, enables the BAS's ADSL transceiver to monitor line conditions and dynamically adapt the data rate seamlessly (without bit errors or requiring a service interruption for retraining). When SRA occurs, a downstream rate change trap (adslAtucRateChangeTrap) is generated during runtime. Customers must ensure that their ATM application can support dynamic rate change.

You can enable or disable SRA dynamically while the ADSL transceiver is in data mode. SRA is only supported in the downstream direction; upstream SRA is not supported. The receiver initiates SRA, therefore in the downstream direction the CPE (atu-r) is the master and enables SRA.

SRA Parameters

You can control the conditions that trigger SRA by setting the following ADSL parameters:



NOTE: Both bit swapping and SRA monitor the individual bins in order to keep the SNR margin equalized and thus provide a more stable connection. Therefore, SRA will be triggered if the SNR margin/bin in ANY bin falls below or rises above the threshold set by the user.

Rate Mode

The “adsllineconfprofiletable adslatucconfratemode” parameter defines if and when seamless rate adaptation is performed. See “adsllineconfprofiletable adslatucconfratemode {fixed | adaptatstartup | adaptatruntime}” on page 6-53. Possible options are:

- fixed – Do not perform adaptation.
- adaptatstartup – Only perform rate adaptation on initialization.
- adaptatruntime – Perform rate adaptation at any time.

Downstream Upshift Noise Margin

If the downstream noise margin rises above the Downstream Upshift Noise Margin and stays above that specified level for more than the time specified by the Downstream Minimum Upshift Rate Adaptation Interval, the ATU-R will attempt to increase the downstream net data rate. The Downstream Upshift Noise Margin ranges from 0 to 31 dB with 0.1 dB steps. (Units are in dB/10.) See “adsllineconfprofiletable adslaturconfupshiftsnrmgn {<tenth db>}” on page 6-72.

Downstream Minimum Upshift Rate Adaptation Interval

This parameter defines the interval of time the downstream noise margin should stay above the Downstream Upshift Noise Margin before the ATU-R attempts to increase the downstream net data rate. The time interval ranges from 0 to 16383 seconds. (Units are in seconds, with 0 equal to disabled.) See “adsllineconfprofiletable adslaturconfminupshifttime {<seconds>}” on page 6-70.

Downstream Downshift Noise Margin

If the downstream noise margin falls below the level specified by the Downstream Downshift Noise Margin, and stays below that specified level for more than the time specified by the Downstream Minimum Downshift Rate Adaptation Interval, the ATU-R will attempt to decrease the downstream net data rate. The Downstream Downshift Noise Margin ranges from 0 to 31 dB with 0.1 dB steps. (Units are in dB/10.) See “adsllineconfprofiletable adslaturconfdownshiftsnrmgn {<tenth db>}” on page 6-65.

Downstream Minimum Downshift Rate Adaptation Interval

This parameter defines the interval of time the downstream noise margin should stay below the Downstream Downshift Noise Margin before the ATU-R attempts to decrease the downstream net data rate. The time interval ranges from 0 to 16383

seconds. (Units are in seconds, with 0 equal to disabled.) See “adslprofiletable adslaturconfmindownshifttime {<seconds>}” on page 6-68.

Figure 6-1 provides a pictorial view of SRA and how these MIB parameters will be used to manage rate adjustment.

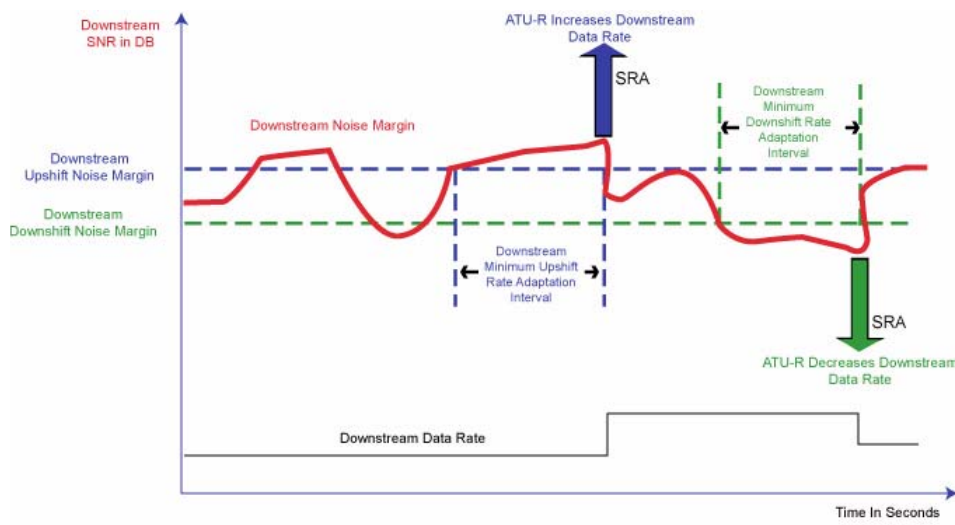


Figure 6-1. Seamless Rate Adaptation

6.16

Configuring ADSL2/2+ Downstream Seamless Rate Adaptation

Optimizing SRA Parameter Settings

The standard provides ranges of valid parameter values for each of the SRA-related parameters. Although a value may fall within the specified range, this does not guarantee that it is optimal for system performance. Therefore, Pannaway recommends the following guidelines for setting the SRA parameters described above.

Upshift and Downshift Noise Margin Settings

Pannaway recommends that you set the upshift (positive) and downshift (negative) margin to a range that is within ± 1 dB (minimum, aggressive setting) to ± 3 dB (maximum, conservative setting) of the Target SNR Margin. See adslprofiletable adslaturconftargetsnrmgn {<tenth db>} on page 6-71 for a description of Target SNR Margin.



CAUTION: Upshift and downshift SNR values are absolute values, and not relative to the target SNR margin. This means that if you change your Target SNR margin, you should be sure to reset the Upshift/Downshift Noise Margin settings accordingly if SRA is enabled.

For example, if Target SNR margin is set to 6 dB, an upshift setting of 7 dB and a downshift setting of 5 dB will form a ± 1 dB margin band around the 6 dB target value.

If you change the Target SNR Margin to 9 dB, you should change the Upshift Noise Margin setting to 10 dB, and the Downshift Noise Margin to 8 dB. This maintains the ± 1 dB band around the new Target SNR Margin.

The default settings are as follows:

- Target SNR Margin: 6 dB
- Upshift Noise Margin: 9 dB (conservative settings)
- Downshift Noise Margin: 3 dB (conservative setting)

6.17

Configuring
ADSL Cabinet
Mode

Setting an upshift/downshift margin to the minimum recommended value (Target SNR Margin + 1 dB) results in a system with more frequent rate adaptation than more conservative settings. Since SRA is completely seamless, and instantaneously calculates an entirely new bit loading for all bins, this minimum recommended setting can reliably be used to produce a more robust system.

Setting an upshift/downshift margin equal to the maximum recommended value (Target SNR Margin + 3 dB) is a fairly conservative setting.

Any value greater than the maximum recommended value of Target SNR Margin + 3dB may render the SRA feature ineffective, since SRA will not occur as often and the full benefit of this feature will not be realized.

**Minimum Upshift and
Downshift Rate
Adaptation Interval
Settings**

Bit swapping and SRA work in unison to keep the downstream SNR margin between the specified upshift/downshift values. Bit swapping is always enabled, and will keep adjusting the bit loading until the value of SNR margin is equalized across all bins. SRA will trigger a change in data rate, with completely new bit loading, only if bit swapping is unable to bring the margin of any bin back to the allowable range set by upshift and downshift margin within the given time (upshift and downshift interval).

Pannaway recommends that you set the minimum upshift/downshift rate adaptation interval to 30 seconds, as this is long enough to realize the benefits of bit swapping, while short enough to ensure responsive SRA performance.

6.17 Configuring ADSL Cabinet Mode

ADSL2+ provides a feature called “cabinet mode”. This feature was developed for the Digital Loop Carrier (DLC) environment in order to address crosstalk interference found in the DLC cabinets (hence the name).

Cabinet mode is designed to operate with existing ADSL line deployments. In order to avoid interference with existing deployments, when you enable cabinet mode on an ADSL2+ lines, the first 256 downstream bins of those lines are turned off and downstream transmission takes place in the upper 256 bins of the spectrum. Upstream transmission remains the same as in normal ADSL2+ operation.



NOTE: Since the DSLAM (BAS) is deployed in DLC cabinets close to the customer premises, the loop lengths are short.

In addition, since the number of downstream bins is halved, the attainable net data rate is lower while a line is in cabinet mode.

When configuring Cabinet Mode, you need to take the following action to configure the ADSL2+ line appropriately:

- If desired, enable or disable hand shake tones being sent on higher bins for Cabinet Mode. See “adslprofiletable adslatucnfcabinethsenable {enable | disable}” on page 6-35 for information.



NOTE: The hand shake tone setting must be the same for both the CPE and the BAS. By default, hand shaking is disabled at both the BAS and the Pannaway’s ADSL CPE devices. If you choose to enable hand shake tones, it must be enabled at both ends of the connection.

```
configure interface adsl {<port> | <port-range> | all} cabinet-mode
```

Summary Activate cabinet mode on the selected interface(s).

Required Mode Interface Config

User Entered Parameters {<port> / <port-range> / all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

Description This command activates cabinet mode on the selected interfaces, so that the first 256 downstream bins are disabled and data transmission occurs in the upper range of the ADSL spectrum.

“no” Form no configure interface adsl {<port> | <port-range> | all} cabinet-mode
The “no” form of the command disables cabinet mode for the designated port or ports.

Defaults Not configured.

Example

```
BASR(config-if)# cabinet-mode
```

Related Commands adsl lineconf profile table adsl atuc conf cabin eths enable {enable | disable} on page 6-35

6.18

Configuring ADSL Minimum Rate Alarms

6.18 Configuring ADSL Minimum Rate Alarms

Revision 2.2 of the BAS provides extended troubleshooting capabilities with the introduction of minimum rate alarm feature. Minimum rate alarms are triggered when an ADSL line re-initializes at line rate lower than a defined threshold (in either the upstream or downstream direction). These alarms are forwarded to the Broadband Access Manager server (as well as stored in the alarm log and written to the CLI if logging to console is enabled), so that network technicians can be alerted to a potential network problem. Use the following commands to configure minimum rate alarms:

```
configure interface adsl {<port> | <port-range> | all} min-rate-alarm downstream <threshold value>
```

Summary Configure a minimum rate alarm threshold, used to trigger an alarm based upon the line rate detected in the downstream direction upon line re-initialization.

Required Mode Interface Config

User Entered Parameters {<port> / <port-range> / all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

<threshold value>

The desired line rate threshold at which the minimum rate alarm will be triggered. This is the minimum expected line rate upon line re-initialization; a lower transmit rate will cause the alarm to be generated.

6.18

Configuring
ADSL Minimum
Rate Alarms

CAUTION: This value must fall between the specified minimum and maximum transmit rates for the line (as determined by the `adsllineconfprofiletable` values for `adslatucchanconfastmintxrate`, `adslatucchanconfastmaxtxrate`, `adslatucchanconfinterleavedmintxrate`, and `adslatucchanconfinterleavedmaxtxrate` values). If the threshold is outside of these ranges, an error message appears and no threshold provisioning takes place.

If you are provisioning multiple ports in the same command, the command will fail for those ports with an invalid threshold and succeed for any ports for which the threshold is legal (between the ports' minimum/maximum transmit rates).

Description This command provisions a minimum rate alarm threshold, used to trigger an alarm based upon the line rate detected in the downstream direction upon line re-initialization. If the line rate is lower than the specified threshold, the BAS issues an alarm that is issued to the BAM server (assuming the network is appropriately configured).

The time-stamped alarm information indicates that the port on which the alarm was triggered, as well as the alarm type (ADSL ATU-C Minimum Tx Rate Threshold). Examining the event log for an event with a corresponding time stamp will indicate the retrain rate that caused the alarm to be triggered.

“no” form no configure interface adsl {<port> | <port-range> | all} min-rate-alarm downstream
The “no” form of the command clears the alarm setting on the designated port or ports.

Defaults Not configured

Example

```
BASR# configure interface adsl 1 min-rate-alarm downstream 24500000
```

Related Commands show interface adsl {<port> | <port-range> | all} min-rate-alarm {upstream | downstream} on page 6-151

configure interface adsl {<port> | <port-range> | all} min-rate-alarm upstream <threshold value>

Summary Configure a minimum rate alarm threshold, used to trigger an alarm based upon the line rate detected in the upstream direction upon line re-initialization.

Required Mode Interface Config

User Entered Parameters {<port> | <port-range> | all}

Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

<threshold value>

The desired line rate threshold at which the minimum rate alarm will be triggered. This is the minimum expected line rate upon line re-initialization; a lower transmit rate will cause the alarm to be generated.



CAUTION: This value must fall between the specified minimum and maximum transmit rates for the line, as determined by the `adsllineconfprofiletable` values for `adslatu-c/atu-r chanconfastmintxrate`, `chanconfastmaxtxrate`, `chanconfinterleavedmintxrate`, and `chanconfinterleavedmaxtxrate` values. If the threshold is outside of these ranges, an error message appears and no threshold provisioning takes place.

If you are provisioning multiple ports in the same command, the command will fail for those ports with an invalid threshold and succeed for any ports for which the threshold is legal (between the ports' minimum/maximum transmit rates).

6.18

Configuring ADSL Minimum Rate Alarms

Description This command provisions a minimum rate alarm threshold, used to trigger an alarm based upon the line rate detected in the upstream direction upon line re-initialization. If the line rate is lower than the specified threshold, the BAS issues an alarm that is issued to the BAM server (assuming the network is appropriately configured).

The time-stamped alarm information indicates that the port on which the alarm was triggered, as well as the alarm type (ADSL ATU-R Minimum Tx Rate Threshold). Examining the event log for an event with a corresponding time stamp will indicate the retrain rate that caused the alarm to be triggered.

“no” form `no configure interface adsl {<port> | <port-range> | all} min-rate-alarm upstream`
The “no” form of the command clears the alarm setting on the designated port or ports.

Defaults Not configured

Example

```
BASR# configure interface adsl 1 min-rate-alarm upstream 1000000
```

Related Commands `show interface adsl {<port> | <port-range> | all} min-rate-alarm {upstream | downstream}` on page 6-151

```
show interface adsl {<port> | <port-range> | all} min-rate-alarm {upstream | downstream}
```

Summary Display the settings for the minimum rate alarm.

Required Mode Global Config

User-Entered Parameters `{<port> / <port-range> / all}`
Selects a single ADSL port, a contiguous range of ADSL ports (for example 1-14 or 7-10), or all ADSL ports on the BAS.

`{upstream / downstream}`

The specific threshold setting to display: the upstream threshold or downstream threshold.

Description This command displays the current setting for the minimum rate alarm in the upstream or downstream directions.

Example

```

BASR# show interface adsl 1-4 min-rate-alarm downstream
Port  Description MinRateAlarm Downstream
-----
01                                0
02                                0
03                                0
04                                500

```

Command Output: The following information is presented:

Port	The associated ADSL port index.
MinRateAlarm Downstream MinRateAlarm Upstream	The current setting for the downstream or upstream rate threshold value.

Related Commands configure interface adsl {<port> | <port-range> | all} min-rate-alarm downstream <threshold value> on page 6-149
 configure interface adsl {<port> | <port-range> | all} min-rate-alarm upstream <threshold value> on page 6-150

6.18

Configuring
ADSL Minimum
Rate Alarms



Chapter 7

Voice Configuration

This chapter details the commands used to configure the telephone functionality of the BAS's on-board DSP, including enabling the voice DSP and assigning its IP address, configuring SIP services or MGCP information, and configuring lifeline and POTS telephony services. It also describes the show commands used to display voice information.

7.1 Contents of this Chapter

This chapter contains the following sections:

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7.2 BAS Voice Functionality Overview

The BAS has an on board Digital Signal Processor (DSP) that provides voice service to directly connected local phone loops and to Pannaway CPE equipment (PBG-ADSLs and RGN-4xx series) that enter lifeline mode if an ADSL link goes down.

New Features

Version 2.2 of BAS firmware introduces the following significant new and revised voice features:

- New support for subscriber services, including call transfer.
- SIP interoperability with Nortel, Metaswitch, CopperCom, Tekelec, and Broadsoft soft switches.
- Revised “lifeline” manager.

7.2

BAS Voice Functionality Overview

Deploying Voice Services

The procedure for activating voice services on the BAS is as follows:

- Configure a voice VLAN to isolate voice services from other network traffic (if desired).
- Assign network information to the onboard voice DSP, including its IP address and default gateway. This information can be associated with the voice VLAN or with the data IP address.
- If using SIP to support voice services:
 - Configure the SIP network information required to provide voice services, including the appropriate soft switch type.
 - Configure any BAS ports for lifeline service to downstream Pannaway CPE devices.
 - Configure any BAS ports for POTS-only service (local loop connections to the BAS for voice-only service or voice/data services that use externally split phone lines).
- If using MGCP to support voice services:
 - Configure the MGCP network information required to provide voice services.
 - Configure any BAS ports for MGCP operation.
- Configure any necessary line parameters, such as impedance and loss plan.



NOTE: The BAS provides simultaneous support for both SIP and MGCP voice deployments. No lifeline support is available for a port provisioned for MGCP operation.

In addition, lifeline support does not apply to the BAS-POTS48R device.



NOTE: The voice commands do not apply to the BAS-ADSL48R-DATA device.

SIP Operation

The BAS 2.2 is intended to work with a Pannaway-certified soft switch. You must specify the authentication and address parameters for the BAS to register as a SIP client with the soft switch (and redundant soft switch, if on the network). A subscriber line is enabled once the BAS successfully registers with the soft switch.

Call features are enabled for the subscriber at the soft switch. Depending on the type of soft switch, some call features may also have to be locally enabled on the BAS itself.



NOTE: For backward compatibility with the discontinued Pannaway CCM, the BAS still supports a dynamic exchange of Call Processing Language (CPL) messages between the SIP endpoints. CPL is discussed in more detail in RFC 3880: Call Processing Language (CPL): A Language for User Control of Internet Telephony Services. Refer to the BAS 2.0 Administration Guide for more information about CPL operation between the BAS, CCM (or other CPL proxy), and Pannaway CPE.

Once SIP is enabled and configured, the BAS's lifeline feature can provide call services to Pannaway PBX and RGN-4xx products if the ADSL link goes down due to reasons ranging from a loss of power at the customer premises or an unplugged device. In this mode, the BAS assumes the role of SIP client for the downstream CPE's primary line (Line 1 of the CPE). Inbound and outbound SIP calls and voice media connections are

7.2

BAS Voice
Functionality
Overview

handled by the BAS on behalf of the CPE, and analog voice signals are passed through to the subscriber's phone. When the ADSL link is restored, the CPE itself becomes the SIP client and the BAS halts its lifeline support for the CPE.

You can also use the BAS to designate POTS ports without lifeline service (a DLC replacement configuration). This lets you directly connect the local copper loop to the BAS for Voice Over IP calls so that you can support subscribers who do not yet need the broadband services provided by a Pannaway PBG/RGN-4xx (or who prefer to use a traditional ADSL modem/phone splitter combination rather than integrated phone/data services provided by Pannaway's PBG/RGN-4xx). When you designate a BAS port as a POTS port, the number of the phone connected via the local loop must have a corresponding entry in the SIP authentication database. From the subscriber point of view, their phone service has not changed, even though calls are now being transmitted via Voice Over IP.

Lifeline and SIP Proxy Servers

The BAS is designed to inter-operate with both forking proxy servers and non-forking proxy servers. A proxy capable of forking can alert multiple SIP clients of an incoming call (assuming there are multiple registrations for a single subscriber call ID). A non-forking proxy can only alert a single call destination.

When the BAS inter-operates with a forking proxy, there are two active registrations for a subscriber number, as both the BAS and the PBG/RGN-4xx register with the proxy. While the ADSL link is up, the BAS declines any SIP invite to that subscriber number and does not ring the line. When the ADSL link is down, the BAS will respond to the SIP invite since the CPE is unreachable, and rings the subscriber line.

With a non-forking proxy, there is only a single active registration for a given subscriber. As long as the ADSL link is down or not completely established (idle or training state), the BAS sends a registration request for the port to which the CPE is connected. In this "lifeline" state, the BAS generates dial tone and is responsible for ringing the subscriber line. When the ADSL link is up (data or "showtime" state), the BAS lets its final registration expire.

The Pannaway PBG/RGN-4xx has a relay that allows its voice services to be switched to a lifeline circuit over the local loop (POTS) or to an internal VoIP circuit.

The BAS 2.2 has a "lifeline manager" service that reacts to transitional ADSL states and POTS ON-/OFF HOOK events, and coordinates registration with the SIP proxy between the BAS and the PBG/RGN-4xx. This lifeline manager is responsible for transitioning the BAS between one of two states: a "Normal" state and a "Lifeline" state.

Normal State

While the PBG/RGN-4xx is providing VoIP service, its Lifeline circuit is inactive and the BAS is in the Normal state (essentially in a standby mode). The BAS transitions into the Normal state when Lifeline is no longer necessary because the ADSL link is up and in showtime, and the VoIP process is active on the CPE.

Depending on whether there is a forking or non-forking proxy, the BAS acts as follows during the Normal state:

- **Forking Proxy** – The SIP user agent on the BAS is always active and registered with the proxy. If the BAS receives a SIP INVITE while the ADSL link is up and in "showtime" state, the BAS issues a SIP DECLINE (603) message.
- **Non-Forking Proxy** – The SIP user agent on the BAS registers with the SIP proxy while it is in Lifeline mode, but upon entering into Normal state it lets its registration expire after the ADSL link is up and in "showtime" state.

7.2

BAS Voice Functionality Overview

Lifeline State

When the PBG/RGN-4xx is powered off, or its ADSL link is down, its voice relay switches to the Lifeline circuit state. This allows the BAS to detect hook events at the premises. In Lifeline state, the BAS acts as follows:

- When the PBG/RGN-4xx is powered OFF or the ADSL link is down, the BAS activates Lifeline to allow POTS to pass through to the local loop. The BAS responds to SIP INVITEs and issues SIP response messages on behalf of the CPE's primary line.
- The PBG/RGN-4xx VoIP process remains inactive as long the ADSL line has not reached "showtime". The PBG/RGN-4xx Lifeline circuit remains open as the ADSL link initializes and trains, and the BAS continues to provide voice services until ADSL showtime/data state is reached and the voice process on the PBG/RGN is ready.
- Once the PBG/RGN-4xx activates its VoIP process, it switches the voice relay to the VoIP circuit and sends a SIP Register request after a brief delay as described below. From this point, voice services are handled by the CPE.

Note that while the BAS is in Lifeline, it will not transition into Normal state if the subscriber phone is OFF-HOOK at the time ADSL service is being restored to the CPE. The BAS will not transition into Normal state until it detects ON-HOOK at the CPE.

- In PBG/RGN version 1.7, there is a brief four second transitional period between when the PBG/RGN's ADSL link reaches "showtime" and when it issues a SIP Register request for its lines. This allows time for the BAS to send out its final registration that keeps its SIP client actively registered throughout the transition. After the ADSL link has achieved showtime, the BAS lets its final registration expire and the PBG/RGN-4xx registration takes effect.

In configurations with a forking proxy, the transition between the BAS registration to the PBG/RGN-4xx registration is seamless (since both registrations remain active with the proxy).

In configurations with a non-forking proxy, the PBG/RGN-4xx registration overwrites the final BAS registration.

Note that if the line is OFF-HOOK at the time ADSL service is restored to the CPE, the BAS refreshes and maintains its SIP client registration until the subscriber phone goes back ON-HOOK. This prevents calls made in the lifeline state from being disconnected.



CAUTION: BAS 2.2 is designed for interoperation with PBG/RGN-4xx firmware version 1.7.x.

With a version 1.6.x PBG/RGN and a non-forking proxy, the BAS final registration can overwrite the PBG/RGN registration when voice service is restored at the PBG/RGN (although the lifeline circuit is closed at the PBG/RGN). In this scenario, voice service would be disrupted at the PBG/RGN until the next time the time the PBG/RGN issues a registration request.

For complete interoperability, Pannaway recommends that the BAS 2.2 be used in conjunction with the latest 1.7.x release of PBG/RGN firmware.

MGCP Operation

The BAS 2.2 supports MGCP for voice services.

MGCP (Media Gateway Control Protocol) – described in IETF RFC 3435 – is a protocol that controls Voice over IP (VoIP) Gateways via external call control elements (termed “Call Agents” or CAs). In this architecture, the call control “intelligence” is outside the gateways and handled by Call Agents – so that it is essentially a Master (CA)/Slave (gateway) protocol. MGCP assumes that CAs synchronize with each other to send coherent commands to the gateways under their control.

MGCP uses a connection model where the basic constructs are physical endpoints (for example, a trunk interface or analog POTS interface), virtual endpoints (for example, an audio source in an audio content server), and point-to-point or multipoint connections between endpoints. A gateway supports a collection of endpoints.

From a BAS standpoint, there is little configuration involved in setting up the voice network for MGCP operation beyond enabling MGCP, identifying the Call Agent responsible for call-handling, and enabling MGCP on a per-port basis. There is no lifeline available for a BAS port that is in MGCP mode.

7.3 Voice VLAN Configuration

BAS version 2.2 supports a voice VLAN that allows you to segregate voice traffic from the data network, making the voice network more secure and stable. The voice DSP on the BAS can be associated with either the voice VLAN or the data network, depending on the IP address assigned to the voice DSP (as described in the next section).

By default, the voice VLAN has a VLAN ID of 4066, although you can change its VLAN identifier. The voice VLAN cannot be deleted, however.

Keep the following information in mind when configuring a voice VLAN:

- VLAN tagging must be implemented on the BAS gigabit Ethernet ports, and on the upstream router (BAR).
- The upstream router (BAR) must have the same VLAN information configured on its gigabit Ethernet ports, and must also have a virtual router configured on the gigabit Ethernet port (to act as the default gateway for the BAS voice network).
- You should configure the voice VLAN prior to configuring the voice DSP address and any SIP network information. If the voice VLAN is configured after the DSP address and SIP network information, the voice VLAN will not take effect until after a BAS reboot.

The following commands are used to configure and view the voice VLAN information.

7.3*Voice VLAN
Configuration*

7.3

Voice VLAN
Configuration

CAUTION: You must configure the voice VLAN information in the following order, otherwise you receive an error message:

1. Configure voice VLAN IP information.
2. Configure voice VLAN default gateway IP address/hostname (virtual router interface).
3. Configure voice DSP IP information.

The voice VLAN IP address, the voice VLAN default gateway IP address/hostname, and the voice DSP IP address must all reside on the same subnet. If they do not, an error message is displayed.

Finally, if the voice DSP is unable to PING the supplied default gateway, a warning is displayed to indicate that network connectivity may affect call setup. Ensure that the virtual router interface is configured with the correct IP information and VLAN identifier.

```
ip address voice-vlan {<ip-address> <subnet mask>}
```

Summary Configures the IP address of the voice VLAN.

Required Mode Global Config

User Entered Parameters *<ip-address>*

The IP address to assign to the voice VLAN, in dotted decimal format (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 255). If a voice VLAN is implemented, this must be on the same subnetwork as the BAS voice DSP's IP address(es). It cannot be on the same network as the BAS data IP address.

<subnet-mask>

The voice VLAN's subnet mask, in dotted-decimal format (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 255).

Description This command configures the IP address of the voice VLAN, and enables voice VLAN functionality.

"no" form no ip-address voice_vlan

The "no" form of this command deletes the voice VLAN's IP address assignment, and disables voice VLAN functionality.

Defaults Not configured

Example

```
BASR(config)# ip address voice-vlan 192.168.2.5
```

Related Commands voice ip address {<ip-address>} [<ip-address-2>] on page 7-8
show voice ip address on page 7-9

7.3

Voice VLAN
Configuration

```
voice ip default-gateway {<ip-address | hostname>}
```

Summary Configures the default gateway address of the voice VLAN.

Required Mode Global Config

User Entered Parameters *<ip-address / hostname>*

The IP address or hostname of the voice VLAN's default gateway, in dotted decimal (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 255) or word format. This identifies the virtual router interface of the upstream router.

Description This command configures the default gateway address/hostname used by the voice VLAN, and enables voice VLAN functionality.



NOTE: You must use the show ip route command to display the voice VLAN default gateway.

"no" form no voice ip default-gateway

The "no" form of this command deletes the voice VLAN's default gateway assignment, and disables voice VLAN functionality.

Defaults Not configured

Example

```
BASR(config)# voice ip default-gateway 192.168.2.1
```

Related Commands

- ip address voice-vlan {<ip-address> <subnet mask>} on page 7-6
- show ip address voice-vlan on page 7-8
- voice ip address {<ip-address>} [<ip-address-2>] on page 7-8
- show voice ip address on page 7-9
- show ip route on page 10-2

```
network voice_vlan {<vlanid>}
```

Summary Assigns a previously configured VLAN ID to the voice VLAN.

Required Mode Global Config

User Entered Parameters *<vlanid>*

A numerical valid VLAN identification number of a previously created VLAN. The range for this field is 1-4094.



CAUTION: Currently the Pannaway BAR supports a VLAN range of 1-4036. You must change the default voice VLAN ID if the upstream router is a Pannaway BAR

Description This command configures the VLAN identifier of the BAS's voice VLAN, and enables voice VLAN functionality.

7.4

Voice IP
Networking
Commands**“no” form** no network voice_vlan

The “no” form of this command restores the default voice VLAN ID of 4066.

Defaults 4066**Example**

BASR(config)# network voice_vlan 4026

Related Commands show vlan [<vlanid>] on page 11-17

show ip address voice-vlan

Summary Displays the voice VLAN IP address.**Required Mode** Privileged Exec, Global Config, Interface Config, or Line Config**User Entered
Parameters** None**Description** This command displays the IP address assigned to the voice VLAN on the BAS.**Example**BASR(config)# show ip address voice-vlan
192.168.2.5**Command Output** IP Address – The IP address assigned to the voice VLAN.**Related Commands** ip address voice-vlan {<ip-address> <subnet mask>} on page 7-6

7.4 Voice IP Networking Commands

The following commands configure and display the BAS voice DSP's IP address.

voice ip address {<ip-address>} [<ip-address-2>]

Summary Configures the IP address of the voice Digital Signal Processor (DSP), and enables voice functionality.**Required Mode** Global Config**User Entered
Parameters** <ip-address>

The IP address to assign to the DSP, in dotted decimal format (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0 to 255).

If no voice VLAN is being used, this must be on the same subnetwork as the BAS's assigned data network IP address.

If a voice VLAN is used, this must be on the same subnetwork as the BAS's assigned voice VLAN IP address.

/<ip-address-2>/

If you have a 48-port BAS variant, you must assign a second IP address to the second DSP on the device.

Description This command configures the IP address of the BAS's DSP, and enables voice functionality. It also associates the voice DSP with either the data network (voice and data co-exist on the same network) or a Voice VLAN network (voice traffic is restricted to a separate VLAN for enhanced security and performance).

"no" form no voice ip address {<ip-address>} [<ip-address-2>]
The "no" form of this command deletes the DSP's IP address assignment, and disables voice functionality for the BAS.

Defaults Not configured

Example

```
BASR(config)# voice ip address 192.168.1.99
```

Related Commands ip address voice-vlan {<ip-address> <subnet mask>} on page 7-6
show voice ip address on page 7-9

show voice ip address

Summary Displays the DSP IP address.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the IP address assigned to the DSP on the BAS.

Example

```
BASR(config)# show voice ip address
192.168.1.99
```

Command Output IP Address – The IP address assigned to the DSP.

Related Commands voice ip address {<ip-address>} [<ip-address-2>] on page 7-8

7.5 Dial Plan Commands

The following commands are used to configure the dial plan for the BAS, and to display dial plan information. A dial plan is used to parse the digits of subscriber calls (the dial string) and forward the call to the SIP server (or time out calls), and provide dial tone feedback for the line as appropriate.

For convenience, the BAS has a pre-created North American dial plan that can be activated for the device. When you select a soft switch type, this North American dial plan is edited for interoperation with that specific soft switch.

You should not have to manually the dial plan except if you need to customize it to tailor the BAS to your serviced calling area's needs. Specifically, you may need to create a custom dial plan entry if your serviced calling area requires 10-digit dialing for local calls. In all other situations, however, selecting the North American dial plan and the specific soft switch type should be the only action required for the BAS to service the voice network.

7.5

Dial Plan
Commands

CAUTION: The BAS applies the dial plan to incoming calls according to the following rules:

- Custom dial plan entries are enforced before the North American dial plan entries.
- Custom dial plan entries are parsed in reverse order of creation, from the most recently created to earliest created custom dial plan.

The digits from an incoming call are matched against all dial plan entries, starting with the top entry and proceeding down entry-by-entry until a prefix match is found for the called number, at which point the call is forwarded to the SIP server.

For this reason, the more specific custom dial plan entries (for example, 10-digit dialing) are enforced before the more liberal/generic matching North American dial plan rules that follow.

As the BAS parses a dial string, it uses a five second time-out to await incoming digits up to the point where call processing is expected to terminate. If no digit is received within that five second time-out, the BAS returns a fast busy tone to the subscriber and drops the dial information without forwarding it to the SIP server.

For domestic calls (local, long distance, or “dial-around”), the dial string is immediately forwarded to the SIP server upon matching a dial plan entry. For example, a local seven digit call (designated in the North American dial plan as a call beginning with any digit from 2–9, and six succeeding digits from 0–9) is immediately forwarded after the seventh digit of the input string is reached.

For international calls, the BAS uses a secondary five second time-out to process and forward the entire dial string (US international dialing prefix, country code, and pertinent area/destination code and subscriber number) to the SIP server, unless a specified maximum number of digits is reached at which point the dial string is immediately forwarded.

The BAS dial plan entry for directly placed international calls is as follows:

011[2-9].....+8

This indicates the following call processing:

- Detect US international dialing prefix **011**
- Detect country code beginning with digit **[2–9]** and allow six added match-any digits (.....).
- Allow up to eight added digits to complete the call to the subscriber number. Wait five seconds after the last digit is detected before forwarding the dial string to the SIP server, unless a specified maximum number of digits (+8) is reached – in which case forward immediately.

For example, a call to Belize might have a dial string of 011-501-2-1234567. In this case, the string is forwarded five seconds after the last digit is detected (because there are fewer digits in the dial string than the maximum allowed).

You can also specify a delay and/or maximum digits to complete a call when creating custom dial plan entries.

dialplan northamerica

Summary Configures the BAS with the North American dial plan when it is providing lifeline support for Pannaway CPE products, or POTS support for a directly connected phone.

Required Mode Global Config**User Entered Parameters** None

Description This command enforces the North American dial plan on the BAS. If no customized dial plan is created, this command **MUST** be used to support lifeline services for Pannaway CPE products, or POTS service for a directly connected local loop phone.

When you perform this command, a North American dial plan is automatically created for the BAS, so that the BAS can parse dial strings received from a provisioned lifeline or POTS phone.



CAUTION: If you do not configure a dial plan, or if you delete a dial plan, a lifeline or POTS phone experiences a dial tone error (fast busy) when attempting to place a call through the BAS. A dial plan must be created for outgoing lifeline or POTS calls placed through the BAS.

“no” form no dialplan northamerica

The “no” form of this command deletes the North American dial plan information; if lifeline or POTS services are to be supported by the BAS, a custom dial plan must be in place.

Defaults Not configured**Example**

```
BASR(config)# dialplan northamerica
```

Related Commands voice dial-peer pots {<port>} on page 7-34
 lifeline {<transition-timer-value> <retrain-timer-value>} on page 7-40
 show voice dialplan on page 7-13

```
voice dial-peer dialplan {<description> <pattern>}
```

Summary Configures a custom dial plan entry for the BAS.**Required Mode** Global Config

User Entered Parameters **<description>**
 A brief textual description of the dial plan entry.

<pattern>
 A SIP dial plan mapping used to determine the validity of dial strings passed to the BAS when it supports call services.

Description This command configures a customized dial plan entry for the BAS. In general, it is used to support areas that require 10-digit dialing of local PSTN calls, so that they can be forwarded to the SIP server appropriately.

When entering the dial plan mapping pattern, you can use the following digit or mask parameters:

- *0-9* – The matching digit. For example, *3.....* indicates that only a 3 is valid in the first place of a seven-digit dial string.

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Dial Plan Commands

- `.` – A wildcard that matches any digit in the 0-9 range is valid. For example, `3.....` indicates that after the first place “3”, digits two through seven of a seven-digit string can be any number in the range 0-9.
- `[x-y]` – A specified range of digits, where x and y can be any digit between 0 and 9. For example `[4-8]` indicates any digit between 4 and 8, inclusive, is valid. For example, a `3[2-6][1-4]....` indicates that the second digit of a received seven-digit dial string must be in the range 2-6, and the third digit must be in the range 1-4.
- `[x,y]` – An either/or match of two specified digits, where x and y can be any digit between 0 and 9. For example, `3[2,3][1-4]....` indicates that the second digit must be either 2 or 3 in a received seven-digit dial string.

You can also use the following dial string parsing operators:

- `T` – A five second time-out after the last received digit, after which the dial string is automatically forwarded using the digits received to that point.
- `+n` – A 5 second forwarding time-out is in effect for the current dial string, unless the remaining input reaches a maximum number “n” of digits (where “n” is any digit between 0 and 9), after which the dial string is immediately forwarded.



NOTE: During call processing, the BAS interprets a pound (#) key entered at the telephone handset as an indicator to terminate processing based on matching input. For example, if the BAS receives a digit input string of `54324#` from the handset, it terminates all further digit processing and forwards the call to the SIP server.



CAUTION: It is possible to create a custom dial plan to support a privately numbered network (PBX-replacement); for example, to support four digit extension dialing in a campus or corporate network. However, any custom dial plan entries must be carefully considered when the BAS supports calls outgoing to the PSTN.

Before you create a custom dial plan entry, keep in mind the order in which each dial plan entry takes effect in call processing:

- Custom dial plan entries take effect before the North American dial plan
- Custom dial plan entries are parsed in reverse chronological order, from most recent custom entry to earliest custom entry.

“no” form `no voice dial-peer dialplan <description> <pattern>`

The “no” form of this command removes the custom dial plan with the given description and pattern.

Defaults No customized dial plan configured.

Example

```
BAS(config)# voice dial-peer dialplan local_calls 74.....
BAS(config)# voice dial-peer dialplan 603_area 603[2-9].....
```

Related Commands `dialplan northamerica` on page 7-10
`show voice dialplan` on page 7-13

show voice dialplan

Summary Displays the dial plan in effect at the BAS, as well as primary and secondary phone numbers configured for ports.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the dial plan set up for the BAS through the *dialplan northamerica* command. It also displays any lifeline or POTS port configuration on the BAS.

Example

```
BAS_10.11.4.7# show voice dialplan

E911 is ENABLED

pattern          destination
-----
*70              feature[6][0]
1170             feature[6][1]
*65             feature[1][0]
1165            feature[1][1]
*85             feature[14][0]
1185            feature[14][1]
*[2,3]..        vsc-3-digit[0]
11[2,3]..       vsc-3-digit[1]
*..            vsc-wildcard[0]
11..           vsc-wildcard[1]
[2-9]11         n11
[2-9].....     local-call
1411           1411
1[2-9].....T   1+local-call
1[2-9]..[2-9]..... long-call
0T             local-operator
0[2-9].....T   local-operator/local-call
0[2-9]..[2-9]..... local-operator/long-call
00T           long-operator
00[2-9]..[2-9]..... long-operator/long-call
011[2-9].....+8 intl-direct
01[2-9].....+8 intl-operator-assist
101....T       casual:operator
101....0T      casual:local-operator
101....00T     casual:long-operator
101....00[2-9]..[2-9]..... casual:long-operator/long-call
101....011[2-9].....+8 casual:intl-direct
101....01[2-9].....+8 casual:intl-operator-assist
101....0[2-9].....T casual:local-operator/local-call
101....0[2-9]..[2-9]..... casual:local-operator/long-call
101....1[2-9]..[2-9]..... casual:long-call
101....[2-9]..... casual:local-call
```

7.5

Dial Plan
Commands

7.5

Dial Plan
Commands

Command Output Entering this command displays the following output:

pattern	A matching pattern for the dial plan or dial-peer entry. This includes any allowable digits defined for a dial plan, or any SIP phone numbers configured for either lifeline or POTS operation.
destination	<p>An indication of the target of the dialed digits.</p> <ul style="list-style-type: none"> If the dialed digits match an entry in the dial plan (but not any lifeline or POTS destinations), the SIP call is sent to the SIP Proxy server. <p>The destination indicates the dial destination (based on the custom or North American dial plan):</p> <ul style="list-style-type: none"> dialplan description (for a custom dial plan) n11 for (411 or 911 calls) local-call (7-digit dialling) long-call (North American 11-digit direct dial) local-operator, local-operator/local-call, local-operator/long-call (with local operator assistance) long-operator, long-operator/long call (with long-distance operator assistance) intl-direct (international direct distance: 011 code followed by up to 15-digit direct dial) intl-operator-assist (international customer dialed operator assistance: 01 code, followed by up to 15-digit direct dial) casual:long-call (North American "dial-around" or 1010 long distance access dialing, using a carrier other than the pre-selected long distance plan provider). casual: operator (operator-assisted "dial-around" or 1010 long distance access dialing). casual with local operator assistance (casual with local-operator, local-operator/local-call, local-operator/long-call) casual with long operator assistance (casual with long-operator, long-operator/long call) casual: intl-direct (International "dial-around" or 10XXX international access dialing, using a carrier other than the pre-selected international plan provider) casual: intl-operator-assist (International "dial-around" with international operator assistance) <ul style="list-style-type: none"> If the dialed digits match a CLASS call feature – *72 or 1172 (rotary/pulse) for call-forwarding, or *73 or 1173 for call-forwarding cancellation for example – the dialed digits are used to direct the SIP call to the SIP Proxy based on the customer input number. If an incoming call matches a provisioned SIP dial-peer (primary or secondary number), the destination is the BAS port associated with that dial-peer.

Related Commands dialplan northamerica on page 7-10
voice dial-peer pots {<port>} on page 7-34
lifeline {<transition-timer-value> <retrain-timer-value>} on page 7-40

7.6 System Level Voice Network Configuration and Display Commands

The following commands configure e911 and RTCP timeout parameters at a system-wide level, and display the set values.

voice e911 enable

Summary Enables or disables local handling of e911 calls by the BAS.

Required Mode Global Config

User Entered Parameters None.

Description This command determines the handling behavior of e911 calls by the BAS:

- If e911 is enabled, the BAS handles e911 calls and sets up the SIP call legs to the PSAP (Public Safety Access Point).
- If e911 is disabled via the “no” form of this command, the soft switch is responsible for handling e911 calls and setting up the call legs.

“no” form no e911 enable
The “no” form of this disables the local handling of e911 calls by the BAS.

Defaults Enabled

Example

```
BASR(config)# voice e911 enable
```

Related Commands show voice e911-cancel on page 7-16

voice e911 cancel enable

Summary Enables or disables ringing of a line-originated e911 call that is terminated before the attendant can answer.

Required Mode Global Config

User Entered Parameters None.

Description This command determines the release behavior of a line-originated e911 call that is terminated before the attendant can answer at the emergency bureau:

- If e911 cancel is enabled, a call that is terminated before call setup is complete is torn down before ringing commences.
- If e911 cancel is disabled via the “no” form of this command, a call that is terminated before call setup is complete results in ringing with a reorder tone upon answering (indicating to the attendant that the line originated call was abandoned before answer, the connection has been lost, and ringback is not available).

“no” form no e911 cancel enable
The “no” form of this disables the e911 cancel feature.

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*System Level
Voice Network
Configuration
and Display
Commands*

Defaults Disabled**Example**

```
BASR(config)# voice e911 cancel enable
```

Related Commands show voice e911-cancel on page 7-16

```
show voice e911
```

Summary Displays the enable/disable state for local e-911 call-handling.**Required Mode** Privileged Exec, Global Config, Interface Config, or Line Config**User Entered Parameters** None**Description** This command displays the configured e-911 call-handling value.**Example**

```
BASR# show voice e911
e911 cancel is enabled
```

Related Commands voice e911 enable on page 7-15

```
show voice e911-cancel
```

Summary Displays the enable/disable state for e-911 cancel.**Required Mode** Privileged Exec, Global Config, Interface Config, or Line Config**User Entered Parameters** None**Description** This command displays the configured e-911 cancel value.**Example**

```
BASR# show voice e911-cancel
e911 cancel is disabled
```

Related Commands voice e911 cancel enable on page 7-15

```
voice rtcp-timeout {<0-3600>}
```

Summary Configures the RTCP (Real Time Transport Control Protocol) timeout value to tear down a dead call-control stream.**Required Mode** Global Config

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User Entered Parameters	<0-3600> The number of seconds used for the RTCP timeout value.
Description	This command assigns timeout value used to tear down a call if RTCP packet transmission halts unexpectedly. After the RTP (voice packet) stream is set up and an RTCP packet is not received within the specified timer duration, the call is terminated. If the upstream Class 4/5 soft switch does not support RTCP, this timer should be set to zero (0).
“no” form	no voice rtcp-timeout The “no” form of this command restores the default RTCP timeout value.
Defaults	300 seconds (five minutes)
Example	

```
BASR(config)# voice rtcp-timeout 60
```

Related Commands show sip default-password on page 7-25

```
show voice rtcp-timeout value
```

Summary	Displays the value set for the RTCP timeout.
Required Mode	Privileged Exec, Global Config, Interface Config, or Line Config
User Entered Parameters	None
Description	This command displays the configured RTCP timeout value.
Example	

```
BASR# show voice rtcp-timeout
```

```
RTCP Timeout: 60
```

Related Commands voice rtcp-timeout {<0-3600>} on page 7-16

7.7

System Level
SIP Commands

7.7 System Level SIP Commands

The following commands are used to enable SIP, specify the SIP Proxy server(s) and type, force a registration, and specify the TCP/UDP port used for SIP communications (if necessary), and set other miscellaneous SIP parameters. You can view all configured parameters using the various “show” commands.



NOTE: These commands do not apply to networks that only implement MGCP for voice services.

```
sip default-password {<default_realm_password>}
```

Summary Configures the default login name used to authenticate the associated SIP network subscriber within the realm.

Required Mode Global Config

User Entered Parameters *<default_realm_password>*
The default login password used to authenticate the SIP subscriber within the realm or protection domain (up to 80 characters).



NOTE: You must surround the password string in quotation marks (""") to use spaces in entry. If you enter a space in the text string without using surrounding quotes, you get a bad command error. It is also illegal to use an apostrophe in the display name.

Description This command assigns the default login used for authentication in the SIP server protection domain. If you create a new SIP dial peer without specifying a password, this password is used for authentication purposes.

“no” form no sip default-password
The “no” form of this command removes the default realm password.

Defaults None set

Example

```
BASR(config)# sip default-password "acme user"
```

Related Commands password {<realm_password>} on page 7-39
show sip default-password on page 7-25

```
sip default-realm {<default_realm_name>}
```

Summary Specifies the default realm used to create new SIP dial peers.

Required Mode Global Config

User Entered Parameters *<default_realm_name>*
The default name of the protection domain for which a SIP network user must have a valid log-in user name and password for authentication purposes.

Description This command defines the default name of the protection domain (or realm) for which a SIP network user must have a valid log-in user name and password for authentication purposes. If you create a new SIP dial peer without specifying a realm, this realm is used for authentication purposes. An unauthorized user is prohibited from accessing the network if authentication is in effect..



NOTE: If the dial-peer entry is for lifeline support of a Pannaway CPE, the SIP realm and password must match that set at the Pannaway CPE.



NOTE: You must surround the realm string in quotation marks ("") to use spaces in entry. If you enter a space in the text string without using surrounding quotes, you get a bad command error. It is also illegal to use an apostrophe in the display name.

“no” form no realm
The “no” form of this command restores the factory default realm name.

Defaults pannaway (factory default)

Example

```
BASR(config)# sip default-realm acmenet
```

Related Commands realm {<realm_name>} on page 7-38
show sip default-realm on page 7-25

sip dtmf-relay enable

Summary Enables or disables SIP DTMF relay on the BAS.

Required Mode Global Config

User Entered Parameters None

Description This command enables the BAS to send DTMF digit information via SIP Info packets. This option should be enabled if the BAS will be connected to a SIP-based Interactive Voice Response (IVR) or voice mail application.

“no” form no sip dtmf-relay enable
The “no” form of this command disables DTMF relay, so that DTMF must be detected inband within the RTP stream instead of out-of-band via SIP Info packets.

Defaults Enabled

Example

```
BASR(config)# sip dtmf-relay enable
```

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System Level
SIP Commands

sip enable

Summary Enables SIP communications on the BAS.

Required Mode Global Config

User Entered Parameters None

Description This command activates SIP communications on the BAS. Once SIP is enabled, the BAS attempts to register with the designated SIP Registrar and performs SIP call setup through the designated SIP proxy.

“no” form no sip enable
The “no” form of this command disables SIP communications on the BAS, and the BAS de-registers from the Registrar Server.



CAUTION: Disabling SIP can disrupt communications on the network, so use this command with caution. If SIP is disabled, the BAS no longer supports POTS service and lifeline support for downstream Pannaway CPE devices. Any calls that are in progress at the time SIP is disabled remain up; however, new POTS or lifeline calls can't be placed while SIP is disabled (the user will not get dial tone).

Defaults Disabled

Example

```
BASR(config)# sip enable
```

Related Commands show sip on page 7-24

sip port {<port number>}

Summary Specifies the source TCP/UDP port used for SIP messaging.

Required Mode Global Config

User Entered Parameters *<port number>*
The source TCP/UDP port number used to set up SIP communications. The valid range is 1 to 65,535.

Description This command specifies the source TCP/UDP port number used for SIP communications. This parameter does not need to be configured if you are using the default port value throughout the SIP network.

“no” form no sip port
The “no” form of this command restores the default SIP port value.

Defaults 5060 (the well-known TCP/UDP port for SIP)

Example

```
BASR(config)# sip port 12345
```

Related Commands sip proxy port {<port number>} on page 7-22
show sip on page 7-24

7.7*System Level
SIP Commands***sip proxy fork enable**

Summary Determines whether the BAS will be inter-operating with a forking or non-forking proxy for lifeline operation.

Required Mode Global Config

User Entered Parameters None

Description This command configures the BAS to inter-operate with a forking or non-forking SIP proxy for lifeline operation. See “Lifeline and SIP Proxy Servers” on page 7-3 for a description of how these types of proxy servers work.



NOTE: BAS release 2.2 permits adjustment of the timers used for lifeline mode with a forking proxy.

“no” form no sip proxy fork enable

The “no” form of this command sets the BAS to inter-operate with a non-forking proxy, so that only a single registration is active per subscriber.

Defaults Disabled for use with non-forking proxies.

Example

```
BASR(config)# sip proxy fork enable
```

Related Commands show sip on page 7-24
lifeline {<transition-timer-value> <retrain-timer-value>} on page 7-40

sip proxy host {<ip-address> | <hostname>} [<ip-address> | <hostname>]

Summary Designates the SIP Proxy server for the BAS.

Required Mode Global Config

User Entered Parameters *<ip-address> and /<ip-address>/*

The IP address of the primary SIP network Proxy server, and optionally the secondary SIP Proxy server.

<hostname> and /<hostname>/

The host name of the SIP Proxy server (if the BAS’s domain name server is operating), and optionally the host name of the secondary SIP Proxy server.

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System Level
SIP Commands

Description This command designates the SIP Proxy server and an optional secondary SIP proxy server for the BAS. The SIP Proxy server acts as both a server and a client for the purpose of making requests on behalf of other SIP clients to forward SIP messages to an appropriate destination. The SIP Proxy may rewrite the original request message, if necessary, to forward it to the appropriate destination. Upon executing this command, the BAS sends all outgoing SIP messages to the Proxy server for call set-up purposes.

You can overwrite the existing SIP Proxy server value with a new IP address/host name. In this case, the BAS uses the newly identified SIP Proxy and forwards SIP messages to that server.

“no” form no sip proxy host

The “no” form of this command deletes the configured SIP Proxy server(s) at the next reset of the BAS. The SIP Proxy server can not be deleted while SIP is enabled, as this could disrupt any calls placed over the SIP network. The deletion of the primary server and optional secondary server takes effect when the BAS is next reset.

Defaults Not configured

Example

```
BASR(config)# sip proxy host 172.16.1.187
```

Related Commands show sip on page 7-24

sip proxy port {<port number>}

Summary Specifies the destination TCP/UDP port used for messaging to the SIP proxy.

Required Mode Global Config

User Entered Parameters <port number>

The destination TCP/UDP port number used to set up communications with the SIP proxy. The valid range is 1 to 65,535.

Description This command specifies the destination TCP/UDP port number used for SIP communications. This parameter does not need to be configured if you are using the default port value throughout the SIP network.

“no” form no sip proxy port

The “no” form of this command restores the default SIP proxy port value.

Defaults 5060 (the well-known TCP/UDP port for SIP)

Example

```
BASR(config)# sip port 12345
```

Related Commands sip port {<port number>} on page 7-20
show sip on page 7-24

```
sip proxy type {pannaway-ccm | nortel | metaswitch | tekelec | standard}
```

Summary Determines the SIP Proxy type being used with the BAS.

Required Mode Global Config

User Entered Parameters *{pannaway-ccm / nortel / metaswitch / tekelec / standard}*

The specific SIP proxy type being used with the BAS:

- metaswitch is a Metaswitch Class4/5 broadband soft switch.
- nortel is a Nortel Class 4/5 broadband soft switch.
- tekelec is a Tekelec Class 4/5 broadband soft switch.
- standard is any other vendor's SIP proxy or Class 4/5 broadband soft switch.
- pannaway-ccm is a Pannaway Technologies' CCM SIP server. This product is no longer supported by Pannaway Technologies, but is included as an option for backward compatibility purposes.

Description This command designates the SIP Proxy (or soft switch) type for the BAS. The BAS has different operational behavior, depending on the selected type:

- If “metaswitch” is selected, the BAS is automatically configured for interoperation with a Metaswitch Class 4/5 broadband soft switch. The dial plan is pre-provisioned for use with a Metaswitch, with vertical service codes (star codes) to be forwarded in a specific format recognized by the Metaswitch soft switch. In addition, it is expected that the BAS will be properly configured for a non-forking proxy, using appropriate lifeline timer values. Any Call Processing Language (CPL) received by the BAS is ignored.
- If “nortel” is selected, the BAS is automatically configured for interoperation with a Nortel Class 4/5 broadband soft switch. The dial plan is pre-provisioned for use with a Nortel, with vertical service codes (star codes) to be forwarded in a specific format recognized by the Nortel soft switch. In addition, it is expected that the BAS will be properly configured for a non-forking proxy, using appropriate lifeline timer values. Any Call Processing Language (CPL) received by the BAS is ignored.
- If “tekelec” is selected, the BAS is automatically configured for interoperation with a Tekelec Class 4/5 broadband soft switch. The dial plan is pre-provisioned for use with a Tekelec, with vertical service codes (star codes) to be forwarded in a specific format recognized by the Tekelec soft switch. In addition, it is expected that the BAS will be properly configured for a non-forking proxy, using appropriate lifeline timer values. Any Call Processing Language (CPL) received by the BAS is ignored.
- If “standard” is selected, the BAS is automatically configured for interoperation with a “generic” soft switch. The BAS does not interpret any vertical service codes (star codes) in the input dial string, and instead forwards them in the SIP invite for remote handling by the soft switch/SIP server. Any Call Processing Language (CPL) received by the BAS is ignored.
- If “pannaway-ccm” is selected, the BAS expects that subscriber features and vertical service code handling are going to be addressed through Call Processing Language (CPL). In addition, the BAS expects forking proxy operation, so no lifeline timer configuration is required. The BAS interprets the vertical service codes (star codes) in the input dial string, and forms the SIP invite based on any handset input following the star code string.

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System Level
SIP Commands

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System Level
SIP Commands**“no” form** no sip proxy type

The “no” form of this command restores the default SIP Proxy server type of “standard.”

Defaults standard**Example**

BASR(config)# sip proxy type metaswitch

Related Commands show sip on page 7-24

sip registration-time {<seconds>}

Summary Specifies the SIP registration time requested by the BAS.**Required Mode** Global Config**User Entered Parameters** <seconds>

The duration (in seconds) that the BAS will request for its registrations to remain active. The valid range is 1 to 65,535.

Description This command sets the duration (in seconds) that the BAS will request to keep its registration valid (as set in the Expires header of the SIP registration message). This may be overwritten by the SIP registrar server.**“no” form** no sip registration-time

The “no” form of this command restores the default registration time value.

Defaults 604800 (one week)**Example**

BASR(config)# sip port 12345

Related Commands show sip registration-time on page 7-26

show sip

Summary Displays information about the SIP configuration.**Required Mode** Privileged Exec, Global Config, Interface Config, or Line Config**User Entered Parameters** None**Description** This command displays various configured SIP parameters.

Example

```

BASR# show sip
                SIP Configuration
-----
UDP Source Port: 5060
Proxy Server: Enabled
Proxy Type: metaswitch
Proxy Host: sipproxy.acme.co. (Primary: 192.16.8.3.4 Secondary: n/a)
Proxy Host Port: 5060

```

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System Level
SIP Commands

Command Output The command displays the following output:

UDP Source Port	The source UDP port assigned to SIP communications.
Proxy Server	Indicates whether SIP communications with the SIP Proxy Server are enabled or disabled.
Proxy Type	The SIP proxy type, currently metaswitch, nortel, tekelec, standard, or pannaway-ccm.
Proxy Host	The hostname and/or IP address of the SIP Proxy server.
Proxy Host Port	The destination TCP/UDP port assigned to SIP communications with the SIP proxy.

Related Commands sip proxy host {<ip-address> | <hostname>} [<ip-address> | <hostname>] on page 7-21
sip proxy port {<port number>} on page 7-22
sip proxy type {pannaway-ccm | nortel | metaswitch | tekelec | standard} on page 7-23
sip port {<port number>} on page 7-20
show sip on page 7-24

show sip default-password

Summary Displays the configured SIP default password.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the configured SIP default password.

Example

```

BASR(config)# show sip default-password

Default SIP password: pannaway

```

Related Commands sip default-password {<default_realm_password>} on page 7-18

show sip default-realm

Summary Displays the configured SIP default realm.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

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SIP Commands

User Entered Parameters None

Description This command displays the configured SIP default password.

Example

```
BASR(config)# show sip default-realm
Default SIP realm: pannaway
```

Related Commands sip default-realm {<default_realm_name>} on page 7-18

show sip registration-time

Summary Displays the currently configured SIP registration time.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the configured SIP registration time.

Example

```
BASR(config)# show sip registration-time
SIP registration time is: 604800 seconds
```

Related Commands sip registration-time {<seconds>} on page 7-24

sip register {<1-48> | all}

Summary Forces the selected voice port(s) to issue a SIP registration message.

Required Mode Privileged Exec

User Entered Parameters **<1-48>**
A specific port that has been configured for voice services (either lifeline or POTS).

all
All ports that support voice services.

Description This command forces a selected voice port (or all voice ports) to issue a SIP registration message (sent to the SIP proxy/registrar server). If no SIP proxy is configured, you receive an error message when attempting to run the command.

Defaults None

Example

```
BASR# sip register 5
```

Related Commands sip proxy host {<ip-address> | <hostname>} [<ip-address> | <hostname>] on page 7-21

7.8 System Level MGCP Commands

The following commands are system-level commands that configure MGCP on a device-wide basis and show MGCP information.

mgcp notified-entity {<controller> <udp port>}

Summary Identifies the controlling Call Agent for the BAS endpoints.

Required Mode Global Config

User Entered **<controller>**

Parameters The IP address (in dotted decimal notation) or fully qualified domain name of the Call Agent entity (mgcpcallagent.acmenet.com). This is usually an Internet telephony gateway, such as the Pannaway NMX-GR303.

<udp port>

The UDP port used for MGCP communications with the Call Agent. The well-known port number for MGCP is 2727.

Description This command configures the Call Agent entity for MGCP operations across the BAS. Note MGCP must be disabled before entering, modifying, or deleting the Call agent entity (as described in the next command).

“no” form no mgcp notified-entity

The “no” form of this command deletes the currently configured Call Agent. Note that MGCP must be disabled before this command can be successfully performed.

Defaults None configured.

Example

```
BASR(config)# mgcp notified-entity 192.168.199.199 2727
```

Related Commands

- mgcp enable on page 7-27
- mgcp rfc2833 enable on page 7-28
- mgcp rfc2833 payload-type {<96-127>} on page 7-29
- show mgcp on page 7-31
- mgcp on page 7-35

mgcp enable

Summary Configures the BAS to support MGCP mode.

Required Mode Global Config

User Entered None

Parameters

Description This command configures the BAS to support MGCP mode. In this mode, the call handling intelligence is external to the BAS (in the Call Agent entity).

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MGCP
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System Level
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NOTE: The MGCP notified entity must be configured before you can execute the “mgcp enable” command.

“no” form no mgcp enable now

The “no” form of this command disables MGCP support on the BAS. This command requires the “now” modifier for immediate shutdown of MGCP. MGCP disabled is the default setting of the BAS.

Defaults MGCP not enabled.

Example

```
BASR(config)# mgcp enable
```

Related Commands mgcp notified-entity {<controller> <udp port>} on page 7-27
mgcp rfc2833 enable on page 7-28
mgcp rfc2833 payload-type {<96-127>} on page 7-29
show mgcp on page 7-31
mgcp on page 7-35

mgcp rfc2833 enable

Summary Configures the BAS to translate telephony events into RFC 2833 Named Telephone Events for in-band transmission within the RTP stream.



CAUTION: This command is not implemented correctly in BAS 2.2, and should not be used. This issue will be fixed in a future firmware release version.

Required Mode Global Config

User Entered Parameters None

Description This command configures the BAS to transmit RTP packets with a payload type that identifies Named Telephony Events (NTE). NTE packets are exchanged between the Internet telephony gateway (such as a Pannaway NMX-GR303) and the CPE (such as a Pannaway BAS) after Network Control Signaling sets up the call.

This method of carrying line and trunk signals – which provides support for Class 5 features over VoIP – is specified by IETF RFC 2833 and CableLabs Line Control Signaling (LCS) specification.

“no” form no mgcp rfc2833 enable

The “no” form of this command disables RFC 2833 MGCP support on the BAS. This setting can be for inter-operation with Internet telephony gateways that don’t support RFC 2833. This is the default setting.

Defaults RFC2833 disabled.

Example

```
BASR(config)# mgcp rfc2833 enable
```

Related Commands mgcp notified-entity {<controller> <udp port>} on page 7-27
 mgcp enable on page 7-27
 mgcp rfc2833 payload-type {<96-127>} on page 7-29
 show mgcp on page 7-31
 mgcp on page 7-35

7.8System Level
MGCP
Commands**mgcp rfc2833 payload-type {<96-127>}**

Summary Configures the Payload Type value for RFC2833 RTP NTE event packets.

Required Mode Global Config

User Entered Parameters **<96-127>**
 An RTP Payload Type value within the range of 96 to 127.

Description This command specifies the payload type used for RTP NTE event packets. The set value must match that set at the upstream Internet telephony gateway (such as the Pannaway NMX-GR303). Available values are within the dynamically settable range of 96–127, as specified in RFC 3551.



TIP: The Pannaway NMX-GR303 uses a default value of 98 for the payload type value.

“no” form no mgcp rfc2833 payload-type
 The “no” form of this command restores the default payload type setting of 100.

Defaults 100

Example

```
BASR(config)# mgcp rfc2833 payload-type 98
```

Related Commands mgcp notified-entity {<controller> <udp port>} on page 7-27
 mgcp enable on page 7-27
 mgcp rfc2833 payload-type {<96-127>} on page 7-29
 show mgcp on page 7-31
 mgcp on page 7-35

mgcp wildcard enable

Summary Enables or disables the sending of MGCP RSIP packets with wildcards.

Required Mode Global Config

User Entered Parameters None.

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Description If this option is enabled, the BAS is configured to send MGCP Restart In Progress (RSIP) packets of the wildcard (*) form “RSIP *@[1.2.3.4]”. This indicates that all of the MGCP endpoints connected to the BAS are being taken out of/put in service.
The default setting is enabled.

Some GR303 gateways do not support the wildcard RSIP format, in which case you must set this option to disabled using the “no” form of this command

“no” form no mgcp wildcard enable
Disables MGCP wildcarding.

Defaults Enabled

Example

```
BASR(config)# mgcp wildcard enable
```

Related Commands show mgcp on page 7-31

mgcp remote-cadence enable

Summary Enables or disables the remote cadence mode that determines whether the VoIP gateway is responsible for governing ring cadence timings.

Required Mode Global Config

User Entered Parameters None.

Description If this option is enabled, the BAS will support Remote Cadence mode. In this mode, all ring cadence timing is controlled by the upstream VoIP gateway. The gateway sends command messages to the BAS to be applied when the BAS generates ring tone. This option allows “firebar ringing” capability. Firebar ringing is essentially a continuous uninterrupted ringing of 15 or more seconds, until a “ring off” message is received. It is used as an emergency reporting service. A failsafe timer mechanism shuts off ringing in firebar mode after 60 seconds if the BAS does not receive a “ring off” message.

“no” form no mgcp remote-cadence enable
The “no” form of this command sets remote-cadence mode back to its default setting of disabled.

Defaults Disabled

Example

```
BASR(config)# mgcp remote-cadence enable
```

Related Commands show mgcp on page 7-31

show mgcp

Summary Displays current MGCP settings on a system-wide level.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays MGCP settings on a system-wide level, and provides some basic MGCP statistics. If MGCP endpoints are configured, endpoint information is also displayed (as described in the following command).

Example

```
BASR# show mgcp
MGCP                               : enabled
RFC 2833                           : disabled
RSIP wildcards                     : enabled
Remote cadence                     : disabled

MGCP notified-entity: 10.1.16.25:2727

  port    reg  enabled  digits      digit buffer      hook  signal
  ----    --  -
  1      CONN   YES     7           7665138    ON-HOOK  l/r g *
  2      CONN   YES     0
                                     ON-HOOK

STATISTICS
-----
Messages sent:                18
Messages received:            181
Messages lost:                 0
Commands completed:           18
Commands retransmitted:        0
Messages with bad versions:    0
Unrecognized messages:         0
```

Command Output The following information is displayed when the “show mgcp” command is performed.

MGCP	Indicates the Enable/Disable state of MGCP.
RFC 2833	Indicates the Enable/Disable state of RFC 2833 MGCP operation.
RFC 2833 RTP payload type	The RTP Payload Type value currently configured for indicating an RTP NTE event packet.
MGCP Notified Entity	The IP address or host name of the MGCP Call Agent entity (the IP Telephony gateway).

The following statistical information is also provided:

Messages sent	The total number of MGCP messages transmitted by the BAS.
Messages received	The total number of MGCP messages received by the BAS.
Messages lost	The total number of MGCP messages sent by the BAS that did not receive a response.

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Commands completed	The number of MGCP commands completed (that is, a command was sent and a response was received).
Commands retransmitted	The total number of MGCP commands that were re-transmitted by the BAS.
Messages with bad versions	The total number of messages received by the BAS with an unsupported MGCP version.
Unrecognized messages	The total number of unrecognizable messages that the BAS received. These are any messages whose header (such as version, profile and transaction) is completely un-parsable.

Related Commands mgcp notified-entity {<controller> <udp port>} on page 7-27
 mgcp enable on page 7-27
 mgcp rfc2833 payload-type {<96-127>} on page 7-29
 show mgcp on page 7-31

show mgcp endpoints

Summary Displays information about the ports that are configured for MGCP operation on the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays all ports on the BAS that are configured for MGCP operation.

Example

```

BASR# show mgcp endpoints
port      reg  enabled  digits      digit buffer      hook  signal
-----
1         CONN  YES      7           7665138          ON-HOOK  l/r g *
2         CONN  YES      0

```

Command Output The following information is displayed when the “show mgcp endpoints” command is performed.

port	Displays the interface index.
reg	Displays the communication/registration state between the interface and the MGCP Call Agent. Possible states are: <ul style="list-style-type: none"> • RESTART -- The endpoint has not yet connected. The restart in progress procedure is underway. • CONN -- The endpoint is currently connected. • DISCONN -- The endpoint was once connected, but some commands were unable to be sent and thus the endpoint is now disconnected. The disconnected restart in progress procedure is underway.
enabled	Displays whether MGCP is enabled for the interface.
digits	A count of digits collected at the BAS for the interface.
digit buffer	The actual digits collected at the BAS for the interface.
hook	Indicates whether the subscriber phone is ON-HOOK or OFF-HOOK.

signal	The last MGCP event/signal that was received on the line, as encoded by MGCP: l/bz (busy tone), l/cf (confirmation tone), l/ci (caller ID), l/dl (dial tone), l/ft (fax tone), l/hd (off-hook transition), l/hf (flash hook), l/lu (on-hook transition), l/L (DTMF long duration), l/ld (long duration connection), l/ma (media start), l/mt (modem tones), l/mwi (message waiting indicator), l/oc (operation complete), l/of (operation failure), l/r0-7 (distinctive ring tones 0-7), l/rg (ringing), l/ro (reorder tone), l/rs (ringsplash), l/rt (ring back tone), l/sl (stutter dial tone), l/t (timer), l/TDD (Telecom Devices for the Deaf tones), l/vmwi (visual message waiting indicator), l/wt1-4 (call waiting tones 1-4), l/X (DTMF tones wildcard). These can be used for debugging/troubleshooting.
--------	---

Related Commands show mgcp on page 7-31
mgcp on page 7-35

show mgcp statistics

Summary Displays system-wide statistical information for MGCP.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays MGCP statistics on a system-wide level. These are the same statistics that are available via the “show mgcp” command.

Example

```
BASR# show mgcp statistics
Messages sent:          3
Messages received:     2172
Messages lost:         0
Commands completed:    3
Commands retransmitted: 0
Messages with bad versions: 0
Unrecognized messages: 0
```

Command Output The following information is displayed when the “show mgcp endpoints” command is performed.

Messages sent	The total number of MGCP messages transmitted by the BAS.
Messages received	The total number of MGCP messages received by the BAS.
Messages lost	The total number of MGCP messages sent by the BAS that did not receive a response.
Commands completed	The number of MGCP commands completed (that is, a command was sent and a response was received).
Commands retransmitted	The total number of MGCP commands that were re-transmitted by the BAS.
Messages with bad versions	The total number of messages received by the BAS with an unsupported MGCP version.

Unrecognized messages

The total number of unrecognizable messages that the BAS received. These are any messages whose header (such as version, profile and transaction) is completely un-parsable.

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POTS Service Provisioning Commands

Related Commands show mgcp on page 7-31

clear mgcp statistics

Summary Resets MGCP statistics.

Required Mode Global Config

User Entered Parameters None

Description This command resets accumulated MGCP statistics back to zero.

Example

```
BASR(config)# clear mgcp statistics
```

Related Commands show mgcp on page 7-31
show mgcp statistics on page 7-33

7.9 POTS Service Provisioning Commands

The following commands are used to configure a phone line for service, including assigning primary and secondary numbers and caller ID information, provisioning lifeline support, configuring transmit and receive signal gain, and locking the line.

This section describes how to configure a BAS port for MGCP operation, or for SIP operation.

The local loop can either support a standard phone that is now able to place calls using the SIP protocol for VOIP, or it can support a Pannaway CPE equipped for VOIP services.



CAUTION: When the BAS is providing POTS services, it must have a dial plan in place so that it can detect the validity of dial digits. If there is no dial plan, a serviced CPE or POTS phone receives a dial-tone error (fast busy) when attempting to place a call through the BAS. You can automatically create a dial plan for the North American region (see dialplan northamerica on page 7-10), or create custom dial plan entries (see voice dial-peer dialplan {<description> <pattern>} on page 7-11).

voice dial-peer pots {<port>}

Summary Enters POTS configuration mode to provision telephony services on a per-port basis.

Required Mode Global Config

User Entered Parameters <port>
The BAS port for which you want to provision POTS functionality or services.

Description This command switches the command prompt into POTS configuration mode for a specific port. Although you can enter all phone provisioning commands directly from Global Config mode, you may find it more convenient to enter this mode to perform multiple commands for a single port.

“no” form None

Example

```
BASR(config)# voice dial-peer pots 16
```

MGCP Configuration Commands

The following command configures MGCP on a specific BAS port while you are in POTS Config mode.

mgcp

Summary Sets the port to operate in MGCP mode.

Required Mode POTS Config

User Entered Parameters None

Description This command configures the port to operate in MGCP mode. In this mode, the call handling intelligence is external to the BAS (in the Call Agent entity).



NOTE: If the port has already been provisioned for SIP services, any provisioned primary and secondary numbers must be deleted before switching the port to MGCP mode (via the “no primary {<pattern>}” and “no secondary {<pattern>}” commands).

Note also that a port provisioned for MGCP mode will not support a lifeline configuration. Although you can enter the commands to provision lifeline for the port, there is no actual lifeline support.

“no” form None

Example

```
BASR(config)# voice dial-peer pots 16 mgcp
```

Related Commands show voice dial-peer {<port>} on page 7-48

SIP Configuration Commands

The following commands configure a port for SIP/POTS operation.

primary {<pattern>}

Summary Configures the primary phone number for the provisioned line.

Required Mode POTS Config

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POTS Service
Provisioning
Commands**User Entered
Parameters** *<pattern>*

When configuring the voice dial peer for POTS, this is the primary phone number to be provisioned for the connected POTS phone or Pannaway CPE-attached phone.

This number must match the number recorded in the “username” portion of the SIP address-of-record (AOR) for this phone in the SIP authentication service.

If the BAS is to provide lifeline services for a Pannaway CPE-attached phone, the primary number must match the primary phone number assigned to the downstream CPE (that is, the number assigned to line 1 of the CPE in the SIP authentication database).

Description This command configures the primary phone number for the connected POTS line. The primary phone number for the POTS line must have a corresponding phone number entry in the SIP authentication database.

“no” form no primary {<pattern>}
The “no” form of this command removes the primary phone number setting. Specify the primary phone number that you want to remove.



NOTE: When you remove the primary phone number from a POTS line, the associated number is “de-registered” from the SIP Proxy server. You must re-provision the primary phone number to restore its POTS service through the SIP server.

Defaults No primary number configured.

Example

```
BASR(pots-16)# primary 6032011016
```

Related Commands secondary {<pattern>} on page 7-36
show voice dial-peer {<port>} on page 7-48

secondary {<pattern>}

Summary Configures the secondary phone number for the provisioned line.

Required Mode POTS Config

**User Entered
Parameters** *<pattern>*

When configuring the voice dial peer for POTS, this is the secondary phone number (also known as a “teen line”) to be provisioned for the connected POTS phone. The teen line provides a distinct ring.



NOTE: This number must match the number recorded in the “username” portion of the SIP address-of-record (AOR) for this secondary phone line in the SIP authentication service.

If the BAS is providing lifeline services for a Pannaway CPE-attached phone, the secondary number must match the secondary number assigned to the primary line of the downstream CPE.



NOTE: This secondary number is used for incoming calls only, so that two numbers can be assigned to the same line. All outgoing calls on this line are identified by the primary number information.

Description This command configures the secondary phone number for the connected POTS line.

“no” form no secondary {<pattern>}
The “no” form of this command removes the secondary phone number setting. Specify the secondary phone number that you want to remove.



NOTE: When you remove the secondary phone number from a POTS line, the associated number is “de-registered” from the SIP Proxy server. You must re-provision the secondary number to restore its POTS service through the SIP server.

Defaults No secondary number configured.

Example

```
BASR(pots-16)# secondary 6032012016
```

Related Commands primary {<pattern>} on page 7-35
show voice dial-peer {<port>} on page 7-48

name {<caller_id_name>}

Summary Configures the name that appears in caller ID messages on a receiving phone.

Required Mode POTS Config

User Entered <caller_id_name>

Parameters A display name, up to 80 characters, that appears in caller ID messages.



NOTE: You must surround the descriptive string in quotation marks ("") to use spaces in entry. If you enter a space in the text string without using surrounding quotes, you get a bad command error. It is also illegal to use an apostrophe in the display name.

Description This command assigns a display name that identifies the calling party assigned to this phone line when Caller ID is active on the receiving phone. This display name is included in the “From” header field of SIP messages that are used to set up, modify, or end voice communications with the connected telephony device.



NOTE: This display name is in effect when phone services are being provided by the BAS; that is, when a regular telephone is connected to the BAS via the local loop, or when the connected Pannaway CPE is in lifeline or POTS mode so that the BAS is providing its telephony services. If the connected Pannaway CPE has on-site power, the caller ID name assigned at the CPE takes precedence. For consistency, the name should be identical both on the BAS and on the Pannaway CPE.

7.9

POTS Service Provisioning Commands

7.9

POTS Service
Provisioning
Commands**“no” form** no name

The “no” form of this command removes the caller ID name from the BAS. The caller ID name is no longer available to a regular telephone, or to a Pannaway CPE when it is in lifeline mode.

Defaults No caller ID name configured.

Example

```
BASR(pots-16)# name "Frank Dunn"
```

Related Commands show voice dial-peer {<port>} on page 7-48

```
realm {<realm_name>}
```

Summary Configures the name of the protection domain associated with the SIP network.

Required Mode POTS Config

User Entered *<realm_name>*

Parameters The name of the protection domain for which a SIP network user must have a valid log-in user name and password for authentication purposes.

Description This command defines the name of the protection domain (or realm) for which a SIP network user must have a valid log-in user name and password for authentication purposes.

SIP provides a stateless, challenge-based mechanism for authentication that is based on HTTP authentication. On receiving a SIP request, a SIP agent or server can challenge the initiator of that request for assurance of the requester's identity. Upon receiving identifying information (realm name and password), the SIP agent or server must ascertain whether the requester is authorized to make the request within the realm. An unauthorized user is prohibited from accessing the network if authentication is in effect.



NOTE: If the dial-peer entry is for lifeline support of a Pannaway CPE, the SIP realm and password must match that set at the Pannaway CPE.

“no” form no realm

The “no” form of this command restores the default realm name (factory-set or administratively configured).

Defaults pannaway

Example

```
BASR(pots-16)# realm acmenet
```

Related Commands sip default-realm {<default_realm_name>} on page 7-18
show sip clients {<port>} on page 7-56

7.9

POTS Service
Provisioning
Commands

login {<login_name>}

Summary Configures the login name used to authenticate the associated SIP network subscriber within the realm.

Required Mode POTS Config

User Entered Parameters *<login_name>*
A login name used to identify the SIP subscriber within the realm or protection domain (up to 80 characters).

Description This command assigns the login used for authentication in the SIP server protection domain.

“no” form no login
The “no” form of this command deletes the login name information.

Defaults None

Example

```
BASR(pots-16)# login 3211234567
```

Related Commands show voice dial-peer {<port>} on page 7-48

password {<realm_password>}

Summary Configures the password used to authenticate the associated SIP network subscriber within the realm.

Required Mode POTS Config

User Entered Parameters *<realm_password>*
An authentication password to identify the SIP subscriber within the realm or protection domain.

Description This command assigns the password used for authentication in the SIP server protection domain.



NOTE: If the dial-peer entry is for lifeline support of a Pannaway CPE, the SIP realm and password must match that set at the Pannaway CPE.

“no” form no password
The “no” form of this command restores the factory-set or administratively defined default authentication password.

Defaults pannaway

Example

```
BASR(pots-16)# password acmenetuserpswd
```

Related Commands sip default-password {<default_realm_password>} on page 7-18
show voice dial-peer {<port>} on page 7-48

7.9

POTS Service Provisioning Commands

lifeline {<transition-timer-value> <retrain-timer-value>}

Summary Enables the SIP lifeline functionality of the BAS for the currently configured port, and configures timing parameters for use with a non-forking proxy (that is, a proxy that handles only one active subscriber registration). See “Lifeline and SIP Proxy Servers” on page 7-3 for a description of how these timers are used with a non-forking proxy.

Required Mode POTS Config

User Entered Parameters <transition-timer-value>

The optional “transition timer” determines the duration (in seconds) for which the BAS will keep the lifeline registration active when it detects ADSL link up after a power-down event. The range for this timer is 0-120 seconds, with a default value of 100 seconds. If set to zero, the transition timer is disabled. You may want to make slight adjustments to this timer as necessary to reduce the brief window of time in which the subscriber is unavailable (between lifeline de-registration and CPE registration).

<retrain-timer-value>

The optional retrain timer is the duration (in seconds) that the BAS waits, once ADSL link goes down, before enforcing the transition timer value described above. This timer essentially allows the BAS to determine whether the link down event is due to a lifeline (power loss) or ADSL retrain event.



CAUTION: Pannaway Technologies recommends that you do not alter the retrain timer value from its default setting without the explicit guidance of Pannaway Technologies’ Technical Assistance Center.

The range for the retrain timer is from 0-120 seconds, with a default of 120. If set to zero, the retrain timer is disabled.

Description This command activates the lifeline functionality of the BAS for the currently configured port. The BAS’s lifeline feature provides call support services to Pannaway CPE products, even when the ADSL link goes down. In this mode, the BAS assumes the role of SIP client for the downstream CPE, so that SIP calls directed to the CPE are handled by the BAS instead and sent out the appropriate port to the downstream CPE. When ADSL link is restored, the CPE itself becomes the SIP client and the BAS halts its lifeline support for the CPE.

To configure lifeline, the primary number assigned to the BAS port must match the primary phone number assigned to the downstream CPE (that is, the number assigned to line 1 of the CPE in the SIP authentication database).



NOTE: The BAS supplies advanced phone feature support in place of the Pannaway CPE while the CPE’s ADSL link is down.



CAUTION: Lifeline support is not available for ports that are configured for MGCP operation, nor is it available for the BAS-POTS48 variant (as that does not support ADSL CPE equipment).

When

“no” form no lifeline

The “no” form of this command de-activates lifeline support for the currently configured port.



NOTE: When you disable lifeline functionality for a port, the associated number is always actively registered with the SIP server.

Defaults Lifeline disabled.

Example

```
BASR(pots-16)# lifeline 120
```

Related Commands show voice dial-peer {<port>} on page 7-48

lock

Summary Locks the port so the connected telephony equipment cannot place or receive calls.

Required Mode POTS Config

User Entered Parameters None

Description This command locks the port so that the line is inactive, and the connected telephony equipment cannot place or receive calls. A subscriber receives a “fast-busy” signal when he or she attempts to place a call other than a 911 call. This option allows you to provision a line without placing it in service until some future date.

“no” form no lock
The “no” form of this unlocks the port so that the line is ready to carry phone service.

Defaults Not locked.

Example

```
BASR(pots-16)# lock
```

Related Commands show voice dial-peer {<port>} on page 7-48

impedance {< 900n | 900l | 900r | 600r >}

Summary Configures the impedance setting for the POTS port.

Required Mode POTS Config

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POTS Service Provisioning Commands

7.9

POTS Service
Provisioning
Commands**User Entered Parameters** **<900n / 900l / 900r / 600r>**

The terminating impedance for the POTS port: 900n (900 ohms complex for a non-loaded line), 900l (900 ohms complex for a loaded line), 900r (900 ohms real), or 600r (600 ohms real).

Description This command configure the terminating impedance for the POTS port. The BAS supports Single Party Loop Start Lines. By default, it is terminated with 900 ohms complex terminating impedance (900 ohms in series with 2.16 μ F for a non-loaded line) for Central Office or Remote Terminal installation, as per the Telcordia GR-57-CORE specification. You may want to specify a different terminating impedance for short loop lengths.



TIP: Impedance mismatches can cause too much echo on the line. With too much echo, the BAS may experience DTMF detection problems (loss of first digit, for example). You should use 600r impedance with short lines, and 900c/r impedance for longer loop lengths (approximately 2000 feet and greater).

“no” form no impedance

The “no” form of this command restores the default setting of 900n for impedance.

Defaults 900n

Example

```
BASR(pots-3)# impedance 600r
```

Related Commands show voice dial-peer {<port>} on page 7-48

receive-loss {<0-6>}

Summary Configures the output attenuation for the POTS port (in db).

Required Mode POTS Config

User Entered Parameters **<0-6>**

The amount to increase the output attenuation: 0, 1, 2, 3, 4, 5, or 6 db.

Description This command configure the amount of attenuation – or signal loss – inserted during digital to analog conversion of voice information.



TIP: We suggest that you start with a setting of 6 db for receive loss.

“no” form no receive-loss

The “no” form of this command restores the default setting of 0 db for receive loss.

Defaults 0 db

Example

```
BASR(pots-3)# receive-loss 6
```

Related Commands transmit-loss {<0-6>} on page 7-43

transmit-loss {<0-6>}

Summary Configures the input attenuation for the POTS port.

Required Mode POTS Config

User Entered Parameters <0-6>

The amount to increase the input attenuation: 0, 1, 2, 3, 4, 5, or 6 db.

Description This command configures the amount of attenuation – or signal loss – inserted when the analog voice signal is converted to digital information.



TIP: We suggest that you start with a setting of 6 db for receive loss, and 0 db for transmit loss.

“no” form no transmit loss

The “no” form of this command restores the default setting of 0 db for transmit gain.

Defaults 0 db

Example

```
BASR(pots-3)# transmit-loss 6
```

Related Commands receive-loss {<0-6>} on page 7-42

Feature Provisioning Commands

The following commands are used to provision BAS support for various subscriber features. These commands should be used when these subscriber features are not able to be provisioned/supported by an upstream Class 4/5 soft switch.

automatic-callback

Summary Provisions the subscriber line for *69 call return.

Required Mode POTS Config

User Entered Parameters None

Description This command configures *69 automatic callback for the subscriber line. Pressing *69 at the handset dials the number of the last incoming call.

“no” form no automatic-callback

The “no” form of this command de-activates *69 automatic callback for the subscriber line.

Defaults Not configured.

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POTS Service Provisioning Commands

Example

```
BASR(config)# voice dial-peer pots 3 automatic-callback
```

Related Commands show voice dial-peer {<port>} on page 7-48

7.9

POTS Service
Provisioning
Commands

automatic-recall

Summary Provisions the subscriber line for *66 automatic redial.

Required Mode POTS Config

**User Entered
Parameters** None

Description This command configures *66 automatic redial for the subscriber line. Pressing *66 at the handset redials the last called number.

“no” form no automatic-callback
The “no” form of this command de-activates *66 automatic recall for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 automatic-recall
```

Related Commands show voice dial-peer {<port>} on page 7-48

call-transfer

Summary Provisions the subscriber line for call transfer.

Required Mode POTS Config

**User Entered
Parameters** None

Description This command configures call transfer for the subscriber line. When this feature is active, the subscriber can transfer a call from a calling party to a second party. This can be performed as a blind transfer (hang-up before hearing result), as an attended transfer (wait for second party answer and then hang up), or as a three-way call (remain on the line with both parties).

“no” form no call-waiting
The “no” form of this command de-activates call transfer for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 call-transfer
```

Related Commands show voice dial-peer {<port>} on page 7-48

7.9

POTS Service
Provisioning
Commands

call-waiting

Summary Provisions the subscriber line for call waiting.

Required Mode POTS Config

**User Entered
Parameters** None

Description This command configures call waiting for the subscriber line. When the subscriber is on the line, he or she hears a tone when there is another incoming call.

“no” form no call-waiting
The “no” form of this command de-activates call waiting for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 call-waiting
```

Related Commands show voice dial-peer {<port>} on page 7-48

caller-id

Summary Provisions the subscriber line for caller ID.

Required Mode POTS Config

**User Entered
Parameters** None

Description This command configures caller ID for the subscriber line. When the subscriber receives an incoming call, the caller is identified in an information display (on telephones that support the feature).

“no” form no caller-id
The “no” form of this command de-activates caller ID for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 caller-id
```

Related Commands show voice dial-peer {<port>} on page 7-48

7.9

POTS Service
Provisioning
Commands

distinctive-ringing

Summary Provisions the subscriber line for distinctive ringing.

Required Mode POTS Config

User Entered Parameters None

Description This command configures distinctive ringing for the subscriber line. The subscriber has the option of associating a distinctive ring with a specified caller or calling party type.

“no” form no distinctive-ringing
The “no” form of this command de-activates distinctive ringing for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 distinctive-ringing
```

Related Commands show voice dial-peer {<port>} on page 7-48

do-not-disturb

Summary Provisions the subscriber line for do-not-disturb (for use with a Nortel soft-switch).

Required Mode POTS Config

User Entered Parameters None

Description This command configures do not disturb for the subscriber line. When this feature is active, any incoming caller hears a busy signal for the line and the line does not ring.



CAUTION: This feature is intended for interoperation with a Nortel soft-switch. It is not applicable when other soft-switches are used. To use this feature, call-waiting must also be active on the line, and the *78 and *79 vertical service codes must be present in the dial plan.

“no” form no do-not-disturb
The “no” form of this command de-activates do-not-disturb for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 do-not-disturb
```

Related Commands show voice dial-peer {<port>} on page 7-48

mwi

Summary Provisions the subscriber line for message waiting indicator support.

Required Mode POTS Config

User Entered Parameters None

Description This command configures message waiting indicator (MWI) support for the subscriber line. This displays a visual signal on the phone or handset to show that voice mail has been left in the subscriber mailbox. This requires that voice mail be correctly configured on a media/feature server for the associated subscriber.

“no” form no mwi
The “no” form of this command de-activates message waiting indicator for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 mwi
```

Related Commands show voice dial-peer {<port>} on page 7-48

7.9

POTS Service
Provisioning
Commands

three-way-calling

Summary Provisions the subscriber line for three-way calling support.

Required Mode POTS Config

User Entered Parameters None

Description This command configures three-way calling support for the subscriber line. This allows the subscriber to call two other parties simultaneously. To use this feature, the subscriber dials the first party, presses the Link or Flash button (or the phone’s hook switch) to put the first party on hold, waits for a steady dial-tone, and then dials the second party. When the second party responds, the subscriber presses Link/Flash/Hook again to bring the first party into the conversation.

“no” form no three-way-calling
The “no” form of this command de-activates three-way calling for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 three-way-calling
```

Related Commands show voice dial-peer {<port>} on page 7-48

7.9

POTS Service
Provisioning
Commands

warm-line {<dial-pattern>}

Summary Provisions the subscriber line for warm-line support.

Required Mode POTS Config

User Entered Parameters *<dial-pattern>*
The subscriber-selected telephone number to be called.

Description This command configures warm line (emergency calling) support for the subscriber line. This allows the subscriber to pre-select a telephone number to be automatically called if there is no dial input at the handset within 30 seconds once the phone goes off-hook.

“no” form no warm-line
The “no” form of this command de-activates warm-line support for the subscriber line.

Defaults Not configured.

Example

```
BASR(config)# voice dial-peer pots 3 warm-line 5551212
```

Related Commands show voice dial-peer {<port>} on page 7-48

POTS and SIP Display Commands The following commands displays line provisioning and POTS services for a port, as well as SIP client information.

show voice dial-peer {<port>}

Summary Displays the line provisioning and POTS services enabled for a given port.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters *<port>*
The BAS port for which you want to view line and phone provisioning information.

Description This command displays the line provisioning information and service configuration information available for a specified port, as well as some diagnostic information.

Example The following example displays a port configured for SIP operation.


```

BASR# show voice dial-peer 3

    port: 3
    name: John Smith
primary number: 6031231234
secondary line: <none>
    login: 6031231234
    realm: pannaway
    password: pannaway
    timeslot: <none>
    rtp port: <none>
    dsp: 0
    locked: NO
    enabled: NO
    lifeline: INACTIVE
hook-state: ON-HOOK
    ecan: DISABLED
    nlp: DISABLED
    vad: DISABLED
    ptime: 20
    format: PCM-U
    rx-loss: 0dB
    tx-loss: 0dB
    impedance: 900n
    config from: CLI
call fwd (*72): DISABLED
call fwd (*90): DISABLED
call fwd (*92): DISABLED
call fwd (*68): DISABLED
    call waiting: ENABLED
        vmwi: ENABLED
    caller id: ENABLED (ACTIVE)
call id block: SELECTIVE
    auto recall: ENABLED
    auto callback: ENABLED
    distinct ring: ENABLED
    distinct wait: ENABLED
    restrict call: DISABLED
    call trace: DISABLED
three way call: ENABLED
do not disturb: DISABLED
    speed-dial: DISABLED
    warm-line: 5551212
    dtmf digits:
channel handle: 841e16e0
    vmc handle: 0
    e911 state: IDLE (0)
    vmc state: UNKNOWN (0)
    twc state: IDLE (0)
    cw state: IDLE (0)

```

7.9

POTS Service Provisioning Commands

The following example displays a port configured for MGCP operation.

7.9

POTS Service Provisioning Commands

```
BASR(config)# show voice dial-peer 2
```

```

    port: 2
    name: <none>
primary number: <none>
secondary line: <none>
    login: <none>
    realm: pannaway
    password: pannaway
    timeslot: <none>
    rtp port: <none>
    dsp: 1
    locked: NO
    enabled: YES
    lifeline: DISABLED
hook-state: ON-HOOK
    ecan: ENABLED
    nlp: ENABLED
    vad: DISABLED
    ptime: 20
    format: PCM-U
    rx-loss: 6dB
    tx-loss: 0dB
    impedance: 900n
    dtmf digits:
channel handle: 83fd5700
    vmc handle: 0
    e911 state: IDLE (0)
    vmc state: IDLE (1)
    twc state: IDLE (0)
    cw state: IDLE (0)

```

Command Output Entering this command displays the following basic provisioning information for the specified POTS port. Most of these will not apply to a port configured for MGCP operation.

port	The BAS port for which POTS information is being displayed.
name	The caller ID name assigned to the BAS port, or <none> if unassigned.
primary number	The primary phone number assigned to the BAS port.
secondary line	The secondary phone number assigned to the BAS port (if any).
login	The login name used to authenticate the associated SIP network subscriber within the realm.
realm	The unique identifier for the SIP server protection domain.
password	The authentication password for the dial-peer entry for the SIP server protection domain.
timeslot	The index of the timeslot associated with the port. The timeslot value (0-47) is one lower than the corresponding interface index (1-48).
rtp port	The RTP port dynamically allocated when the subscriber goes off-hook.
dsp	The index of the DSP associated with the port, 0 or 1. 32-port BAS devices support a single DSP; 48-port BAS devices support dual DSPs.

7.9

POTS Service
Provisioning
Commands

locked	Indicates whether locking is enabled (YES) or disabled (NO) for the POTS port.
enabled	Indicates whether the POTS port is enabled (YES) or inactive (NO).
lifeline	Indicates if the SIP dial-peer entry is configured for lifeline mode (enabled or disabled), and if enabled whether lifeline is active or inactive.
hook-state	Indicates the state of the connected lifeline or POTS phone: ON-HOOK (not calling) or OFF-HOOK (calling).
ecan	Indicates whether echo cancellation is Enabled or Disabled for the BAS DSP. By default, echo cancellation is enabled on the DSP, unless a custom (*99) dial string is received that indicates a modem is dialing-in.
nlp	Indicates whether a Non-Linear Processor (NLP) is Enabled or Disabled for the BAS. The NLP assists in reducing residual echo (after initial echo cancellation) and also provides Comfort Noise Generation. By default, the NLP is enabled on the DSP, unless a modem is dialing-in.
vad	Voice Activity Detection (always disabled).
ptime	Packet time interval for RTP (currently fixed at 20 msec).
format	Indicates the codec in use by the DSP for this port. Currently, the BAS only supports PCM-U (G.711 μ -law). This is the standard codec for North American use.
rx-loss	Configured receive loss for the port.
tx-loss	Configured transmit loss for the port.
impedance	The configured impedance value for the port: 900n, 900l, 900r, or 600r.
The command also displays the following feature provisioning information. These subscriber features are either locally provisioned on the BAS or via CPL (for legacy support of the Pannaway CCM). With a legacy Pannaway CCM, when the BAS sends a registration request for a provisioned phone number, it automatically retrieves provisioning information for that number. CPL support features cannot be provisioned through the BAS itself; they can only be provisioned through automatic retrieval of feature configuration. The following features are listed as either ENABLED or DISABLED for the associated port, and ACTIVE or INACTIVE (if applicable).	
config from	CLI (BAS local) or CPL (Call Processing Language for legacy Pannaway CCM).
call fwd (*72)	Call forwarding feature (*72 to activate; *73 to cancel). Legacy CPL support only; not available through CLI.
call fwd (*90)	Variable call forwarding on busy tone feature (*90 to activate; *91 to cancel). Legacy CPL support only; not available through CLI.
call fwd (*92)	Variable call forwarding on no answer feature (*92 to activate; *93 to cancel). Legacy CPL support only; not available through CLI.
call fwd (*68)	Complete call forwarding on no answer feature (*68 to activate; *88 to cancel). Legacy CPL support only; not available through CLI.
call waiting	Call waiting feature (*70 to cancel)
vmwi	Voice Mail Waiting Indicator feature
caller id	Caller ID feature (*85 to activate; *65 to block ID/name display per outgoing call)
call id block	Complete caller ID blocking (*82 to activate; *67 to override per call)
auto recall	*69 Missed call return
auto callback	*66 Automatic Redial (not supported on CPE)

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POTS Service
Provisioning
Commands

locked	Indicates whether locking is enabled (YES) or disabled (NO) for the POTS port.
enabled	Indicates whether the POTS port is enabled (YES) or inactive (NO).
lifeline	Indicates if the SIP dial-peer entry is configured for lifeline mode (enabled or disabled), and if enabled whether lifeline is active or inactive.
hook-state	Indicates the state of the connected lifeline or POTS phone: ON-HOOK (not calling) or OFF-HOOK (calling).
ecan	Indicates whether echo cancellation is Enabled or Disabled for the BAS DSP. By default, echo cancellation is enabled on the DSP, unless a custom (*99) dial string is received that indicates a modem is dialing-in.
nlp	Indicates whether a Non-Linear Processor (NLP) is Enabled or Disabled for the BAS. The NLP assists in reducing residual echo (after initial echo cancellation) and also provides Comfort Noise Generation. By default, the NLP is enabled on the DSP, unless a modem is dialing-in.
vad	Voice Activity Detection (always disabled).
ptime	Packet time interval for RTP (currently fixed at 20 msec).
format	Indicates the codec in use by the DSP for this port. Currently, the BAS only supports PCM-U (G.711 μ -law). This is the standard codec for North American use.
rx-loss	Configured receive loss for the port.
tx-loss	Configured transmit loss for the port.
impedance	The configured impedance value for the port: 900n, 900l, 900r, or 600r.
The command also displays the following feature provisioning information. These subscriber features are either locally provisioned on the BAS or via CPL (for legacy support of the Pannaway CCM). With a legacy Pannaway CCM, when the BAS sends a registration request for a provisioned phone number, it automatically retrieves provisioning information for that number. CPL support features cannot be provisioned through the BAS itself; they can only be provisioned through automatic retrieval of feature configuration. The following features are listed as either ENABLED or DISABLED for the associated port, and ACTIVE or INACTIVE (if applicable).	
config from	CLI (BAS local) or CPL (Call Processing Language for legacy Pannaway CCM).
call fwd (*72)	Call forwarding feature (*72 to activate; *73 to cancel). Legacy CPL support only; not available through CLI.
call fwd (*90)	Variable call forwarding on busy tone feature (*90 to activate; *91 to cancel). Legacy CPL support only; not available through CLI.
call fwd (*92)	Variable call forwarding on no answer feature (*92 to activate; *93 to cancel). Legacy CPL support only; not available through CLI.
call fwd (*68)	Complete call forwarding on no answer feature (*68 to activate; *88 to cancel). Legacy CPL support only; not available through CLI.
call waiting	Call waiting feature (*70 to cancel)
vmwi	Voice Mail Waiting Indicator feature
caller id	Caller ID feature (*85 to activate; *65 to block ID/name display per outgoing call)
call id block	Complete caller ID blocking (*82 to activate; *67 to override per call)
auto recall	*69 Missed call return
auto callback	*66 Automatic Redial (not supported on CPE)

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distinct ring	Distinct ring feature
distinct wait	Distinct wait tone feature
restrict call	Call restriction. Legacy CPL support only; not available through CLI.
call trace	Customer Originated Trace (*57 to activate). Legacy CPL support only; not available through CLI.
three way call	Three-way calling on hook flash.
do not disturb	Do not disturb (busy) (*78 to activate; *79 to cancel). Legacy CPL support only; not available through CLI.
speed-dial	Speed dial: 8 (*74) or 30 (*75) entries. Legacy CPL support only; not available through CLI.
speed dial index (N-N)	Displays the speed dial entries, as configured by the subscriber.
warm-line	Dial a provisioned number if the line is off-hook for a given period.
dtmf digits	Displays the customer dialed digits prior to call set-up.
channel handle	A software pointer.
vmc handle	A numeric indicator for Voice Media Channel debug purposes.
e911 state	Displays the state of e911 (enhanced 911) providing automatic number identification and automatic location information to the 911 operator: <ul style="list-style-type: none"> • IDLE – no e911 call in progress. • PENDING – e911 call is pending. • SIGNALING OFF-HOOK – signaling PSAP with subscriber off hook. • SIGNALING ON-HOOK – signaling PSAP with subscriber on hook. • ACTIVE OFF-HOOK – active e911 call. • ACTIVE ON-HOOK – active e911 call with subscriber on hook.
vmc state	Voice Media Channel state: <ul style="list-style-type: none"> • IDLE – No voice media connection. • SIGNALING – TDM: signaling connection towards subscriber (dialtone, ring-back). • ACTIVE – Voice media connection.

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twc state	<p>Three Way Calling state:</p> <ul style="list-style-type: none"> • IDLE – TWC is not active. • SIGNALING_ONHOLD_LOCAL – Caller B was placed on-hold by Caller A when initiating a three-way call (transitional state). • SIGNALING_DIALTONE – Caller A received recall tone to dial Caller C. • SIGNALING_DIGITS – Caller A has dialed digits for Caller C. • SIGNALING_PENDING – Caller A has sent out the INVITE and is waiting for a response from Caller C. • SIGNALING_BUSY – Caller C was busy and could not take the call. • SIGNALING_RINGING – Caller C is ringing. • SIGNALING_FAILED – Failure to initiate a call with Caller C. • SIGNALING_CONFERENCING – An interim step to SIGNALING_CONFERENCED. • SIGNALING_CONFERENCED – Callers A and B are in conference while the line for Caller C is ringing or busy. • SIGNALING_DISCONNECT – Caller B disconnected while on hold. • CONFERENCED_1 – Caller C has answered the call and is in a private conversation with Caller A. • CONFERENCED_0 – Caller A flashed to disconnect caller C while in SIGNALING_CONFERENCED or CONFERENCED states. • CONFERENCING – Caller A wants to conference in Caller B after Caller C has answered the call. This is an interim step to CONFERENCED. • CONFERENCED – All parties are in conference. Caller A can flash to disconnect Caller C and resume a normal two-way call with Caller B. • TEARDOWN_ONHOLD – A transitional state when going from a three-way call to a normal two-way call, resulting from either Callers B or C disconnecting or Caller A flashing to disconnect C. • TEARDOWN_RESUMING – A transitional state when going from a three-way call to a normal two-way call, resulting from either Callers B or C disconnecting or Caller A flashing to disconnect C.
cw state	<p>Call Waiting state:</p> <ul style="list-style-type: none"> • IDLE – no call waiting in progress • ALERTING – subscriber is alerted of call waiting • ACTIVE – subscriber is in the call waiting state • ONHOLD_DISCONNECTED – line on hold disconnected • ACTIVE_DISCONNECTED – active line disconnected

Related Commands dialplan northamerica on page 7-10
voice dial-peer pots {<port>} on page 7-34
lifeline {<transition-timer-value> <retrain-timer-value>} on page 7-40

show sip clients

Summary Displays all SIP clients configured for lifeline or POTS mode.

Required Mode Privileged Exec, Global Config, Interface Config, Line Config, or POTS config

User Entered Parameters None

Description This command displays all configured SIP clients/voice dial peers, and indicates whether lifeline state for each dial peer. It also provides status information for each SIP client/voice dial peer.

Example

BASR(pots-16)# show sip clients

port	call-id	format	lifeline	reg	enabled	hook-state	primary client	primary server
1	6032011001	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
1	6032012001	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
2	6032011002	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
2	6032012002	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
3	6032011003	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
3	6032012003	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
4	6032011004	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
4	6032012004	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
5	6032011005	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
5	6032012005	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
6	6032011006	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
6	6032012006	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
7	6032011007	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
7	6032012007	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
8	6032011008	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
8	6032012008	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
9	6032011009	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
9	6032012009	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
10	6032011010	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
10	6032012010	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
11	6032011011	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
11	6032012011	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
12	6032011012	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
12	6032012012	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
13	6032011013	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
13	6032012013	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
14	6032011014	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
14	6032012014	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
15	6032011015	PCM-U	DISABLED	YES	YES	ON-HOOK	YES	YES
15	6032012015	PCM-U	DISABLED	YES	YES	ON-HOOK	NO	YES
16	6032011016	PCM-U	ACTIVE	YES	YES	ON-HOOK	YES	YES
16	6032012016	PCM-U	ACTIVE	YES	YES	ON-HOOK	NO	YES

Command Output Performing the command displays the following output:

port	The BAS port used to configure POTS entry.
call-id	The phone number associated with the primary and secondary numbers of each POTS entry. This is the number configured for the Pannaway CPE's line 1 (lifeline mode) or the number configured for the POTS phone. These numbers are also maintained in the SIP authentication database.
format	Indicates the codec in use by the DSP. Currently, the BAS only supports PCM-U (G.711 μ -law). This is the standard codec for North American use.
lifeline	Indicates whether the SIP client entry is a lifeline configuration (ACTIVE) or a POTS-only configuration (DISABLED).
reg	Indicates if the SIP client has successfully registered with the primary or secondary server (YES = registered; NO = not registered).
enabled	Currently, this field indicates the same information as registration state (YES = registered; NO = not registered).
hook-state	Indicates the state of the connected lifeline or POTS phone: ON-HOOK (not calling) or OFF-HOOK (calling).

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primary client	Indicates if this SIP client entry is the primary client (YES) or the secondary client (NO) of the POTS configuration.
primary server	Indicates if the primary SIP proxy/registrar is currently in use (YES = primary proxy/registrar; NO = secondary proxy/registrar).

```
show sip clients {<port>}
```

Summary Displays detailed SIP information for a specified port.

Required Mode Privileged Exec, Global Config, Interface Config, Line Config, or POTS config

User Entered Parameters *<port>*
The BAS port for which you want to view line and phone provisioning information.

Description This command displays detailed information about the SIP clients that have been configured for either lifeline or POTS mode on a specified port. In addition to configuration information, it provides status information for each client.

Example

```
BASR# show sip client 1

port: 1
call-id: 6039990001
name: 6039990001
login: 6039990001
password: pannaway
realm: pannaway
ptime: 20
format: PCM-U
lifeline: DISABLED
registered: YES
enabled: YES
hook-state: ON-HOOK
primary-client: YES
primary-server: YES
reregister in: 10 minutes
```


Command Output Performing the command displays the following output:

port	The BAS port used to configure the dial-peer entry.
call-id	The phone number associated with the primary and secondary numbers of each POTS entry. This is the number configured for the Pannaway CPE's line 1 (lifeline mode) or the number configured for the POTS phone. These numbers are also maintained in the SIP authentication database.
password	The authentication password for the dial-peer entry for the SIP server protection domain.
realm	The unique identifier for the SIP server protection domain.
ptime	Packet time interval for RTP (currently fixed at 20 msec).
format	Indicates the codec in use by the DSP. Currently, the BAS only supports PCM-U (G.711 μ -law). This is the standard codec for North American use.
lifeline	Indicates whether the SIP client entry is a lifeline configuration (ACTIVE) or a POTS-only configuration (DISABLED).
registered	Indicates if the SIP client has successfully registered with the primary or secondary server (YES = registered; NO = not registered).
enabled	Currently, this field indicates the same information as registration state (YES = registered; NO = not registered).
hook-state	Indicates the state of the connected lifeline or POTS phone: ON-HOOK (not calling) or OFF-HOOK (calling).
primary-client	Indicates if this SIP client entry is the primary client (YES) or the secondary client (NO) of the POTS configuration.
primary-server	Indicates if the primary SIP registrar is currently in use (YES = primary registrar; NO = secondary registrar).
register in	The number of minutes until the next registration, based on the negotiated SIP registration time.

7.10

Voice Session Display Commands

7.10 Voice Session Display Commands

```
show sip call-legs
```

Summary Displays any current SIP calls being processed by the BAS's DSP.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays call details for any SIP calls being processed by the BAS's DSP (lifeline calls or POTS calls).

7.10

Voice Session
Display
Commands**Example**

```

BASR# show sip call-legs
Port Calling ID      Calling IP      Called ID      Called IP      Time(sec)
=====
12  6350023          10.1.1.22      6350055        0
8   6350015          10.1.1.22      6350047        0
3   6350005          10.1.1.22      6350037        0
4   6350007          10.1.1.22      6350039        0
11  6350021          10.1.1.22      6350053        0
2   6350003          10.1.1.22      6350035        0
1   6350001          10.1.1.22      6350033        0
10  6350019          10.1.1.22      6350051        0
5   6350009          10.1.1.22      6350041      10.1.1.21      1
6   6350011          10.1.1.22      6350043      10.1.1.21      1
7   6350013          10.1.1.22      6350045      10.1.1.21      1
9   6350017          10.1.1.22      6350049      10.1.1.21      1

```

Command Output Performing this command displays the following information:

Port	The BAS port associated with the call.
Calling ID	The phone number associated with the call originator. If the calling party is connected to a BAS port, this is the number set via the configure voice dial-peer command.
Calling IP	The IP address associated with the calling party.
Called ID	The phone number associated with the call destination. If the called party is connected to a BAS port, this is the number set via the configure voice dial-peer command.
Called IP	The IP address associated with the call destination. Note that if the call is not set up completely (indicated by time = 0), the Called IP will be blank.
Time (sec)	The duration of the call. Note that if the call is not set up completely, the Time (sec) field displays '0'.

Related Commands voice dial-peer pots {<port>} on page 7-34

show voice sessions

Summary Displays call and channel information for any SIP or MGCP voice sessions currently being processed by the BASR.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays call and channel information for any SIP or MGCP voice sessions currently being processed by the BASR. Information is provided about the call originator and call destination, time slot information, state information for the call and channel, and call feature-specific information.

Example

BASR# show voice se

session	caller	callee
8418c020	10.20.1.76:8780 (ACTIVE)	10.20.1.76:8778 (ACTIVE)
84288180	10.20.1.76:8780 (ACTIVE)	10.20.1.76:8778 (ACTIVE)
84287ba0	10.20.1.76:8782 (ACTIVE)	10.20.1.76:8784 (ACTIVE)
84287980	10.20.1.76:8782 (ACTIVE)	10.20.1.76:8784 (ACTIVE)

port	phone number	lifeline	format	enabled	hook-state	ts	dsp	rtpport
1	6039990001	POTS	PCM-U	YES	OFF-HOOK	0	1	8776
2	6039990002	POTS	PCM-U	YES	ON-HOOK	--	1	---
3	6039990003	POTS	PCM-U	YES	ON-HOOK	--	1	---
4	6039990004	POTS	PCM-U	YES	ON-HOOK	--	1	---
5	6039990005	POTS	PCM-U	YES	ON-HOOK	--	1	---
6	6039990006	POTS	PCM-U	YES	ON-HOOK	--	1	---
7	6039990007	POTS	PCM-U	YES	OFF-HOOK	1	1	8778
8	6039990008	POTS	PCM-U	YES	ON-HOOK	--	1	---
9	6039990009	POTS	PCM-U	YES	ON-HOOK	--	1	---
10	6039990010	POTS	PCM-U	YES	ON-HOOK	--	1	---
11	6039990011	POTS	PCM-U	YES	ON-HOOK	--	1	---
12	6039990012	POTS	PCM-U	YES	ON-HOOK	--	1	---
13	6039990013	POTS	PCM-U	YES	OFF-HOOK	4	1	8784
14	6039990014	POTS	PCM-U	YES	ON-HOOK	--	1	---
15	6039990015	POTS	PCM-U	YES	ON-HOOK	--	1	---
16	6039990016	POTS	PCM-U	YES	ON-HOOK	--	1	---
17	6039990017	POTS	PCM-U	YES	ON-HOOK	--	1	---
18	6039990018	POTS	PCM-U	YES	ON-HOOK	--	1	---
19	6039990019	POTS	PCM-U	YES	ON-HOOK	--	1	---
20	6039990020	POTS	PCM-U	YES	ON-HOOK	--	1	---
21	6039990021	POTS	PCM-U	YES	ON-HOOK	--	1	---
22	6039990022	POTS	PCM-U	YES	ON-HOOK	--	1	---
23	6039990023	POTS	PCM-U	YES	ON-HOOK	--	1	---
24	6039990024	POTS	PCM-U	YES	ON-HOOK	--	1	---
25	6039990025	POTS	PCM-U	YES	ON-HOOK	--	2	---
26	6039990026	POTS	PCM-U	YES	ON-HOOK	--	2	---
27	6039990027	POTS	PCM-U	YES	ON-HOOK	--	2	---
28	6039990028	POTS	PCM-U	YES	ON-HOOK	--	2	---
29	6039990029	POTS	PCM-U	YES	ON-HOOK	--	2	---
30	6039990030	POTS	PCM-U	YES	ON-HOOK	--	2	---
31	6039990031	POTS	PCM-U	YES	ON-HOOK	--	2	---
32	6039990032	POTS	PCM-U	YES	ON-HOOK	--	2	---
33	6039990033	POTS	PCM-U	YES	ON-HOOK	--	2	---
34	6039990034	POTS	PCM-U	YES	ON-HOOK	--	2	---
35	6039990035	POTS	PCM-U	YES	ON-HOOK	--	2	---
36	6039990036	POTS	PCM-U	YES	ON-HOOK	--	2	---
37	6039990037	POTS	PCM-U	YES	ON-HOOK	--	2	---
38	6039990038	POTS	PCM-U	YES	ON-HOOK	--	2	---
39	6039990039	POTS	PCM-U	YES	ON-HOOK	--	2	---
40	6039990040	POTS	PCM-U	YES	ON-HOOK	--	2	---
41	6039990041	POTS	PCM-U	YES	ON-HOOK	--	2	---
42	6039990042	POTS	PCM-U	YES	ON-HOOK	--	2	---
43	6039990043	POTS	PCM-U	YES	ON-HOOK	--	2	---
44	6039990044	POTS	PCM-U	YES	ON-HOOK	--	2	---
45	6039990045	POTS	PCM-U	YES	ON-HOOK	--	2	---
46	6039990046	POTS	PCM-U	YES	ON-HOOK	--	2	---
47	6039990047	POTS	PCM-U	YES	ON-HOOK	--	2	---
48	6039990048	POTS	PCM-U	YES	ON-HOOK	--	2	---

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Command Output When you perform this command, the following information is displayed.

session	Software debugging information (a data structure pointer in memory).
caller	Caller information includes: <ul style="list-style-type: none"> The IP address associated with the call originating party. The RTP (Real Time Transport Protocol) port used to transfer call data at the calling party end. The call state: ACTIVE, RINGBACK, etc.
callee	Callee information includes: <ul style="list-style-type: none"> The IP address associated with the call target party. The RTP (Real Time Transport Protocol) port used to transfer call data at the called party end. The call state: ACTIVE, RINGING, etc.
port	The associated BAS port number.
phone number	The phone number provisioned for the port (SIP only). If the port is connected to a PBX, this corresponds to the primary Line 1 number assigned to the PBX. A phone number is not available for an MGCP endpoint.
lifeline	For a BAS-ADSL variant, indicates whether the SIP dial peer entry is a lifeline configuration (ACTIVE) or a POTS-only configuration (DISABLED); for a BAS-POTS variant, this will always indicate POTS.
format	Indicates the codec in use by the DSP. Currently, the BAS only supports PCM-U (G.711 μ -law). This is the standard codec for North American use.
enabled	Indicates whether the client has registered successfully and the line is enabled (YES = registered/enabled; NO = not registered/disabled).
hook-state	Indicates the state of the connected lifeline or POTS phone: ON-HOOK (not calling) or OFF-HOOK (calling).
ts	The index of the timeslot used for the call. The timeslot value (0-47) is one lower than the corresponding interface index (1-48).
dsp	The index of the DSP used for the call (0 for DSP 1; 1 for DSP 2 in 48-port BAS variants).
rtpport	The RTP port dynamically allocated when the subscriber goes off-hook.

Related Commands voice dial-peer pots {<port>} on page 7-34
lifeline {<transition-timer-value> <retrain-timer-value>} on page 7-40

7.11 Supported Call Features and Modem Support

This section lists and describes the subscriber call features currently supported by the Pannaway BAS. It also describes the required steps for modem support through the BAS.

Supported Call Features and CCM Legacy Support Call Features

The table below lists the call features supported in BAS Version 2.2. The table presents the feature name, the star (*) key code combination required to enable or disable the feature from the telephone handset (as well as any subsequent key entries), and a brief description of the feature and required subscriber actions.

Some of these features are only available in legacy support of the Pannaway CCM, and do not apply to inter-operation with any other Class 4/5 soft switch. These features will be noted as such in the table, with a “CCM Legacy Support” entry under the feature name.

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Supported Call Features and Modem Support

Note that the BAS provides a stutter tone to signal the subscriber that key entry is expected to complete the feature provisioning (for example, to enter a call-forwarding number).

Subscribers who attempt to activate a non-provisioned feature through the handset hear a re-order (fast-busy) tone.

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Supported Call Features and Modem Support

Feature	Key Code	Description
Variable Call Forwarding CCM Legacy Support	*72 to activate *73 to deactivate	Subscriber forwards calls to specified number until feature is deactivated. Required subscriber action: <ul style="list-style-type: none"> • Press *72. • Listen for stutter tone. • Enter number to forward calls to. • Hang up. • Press *73 to disable.
Variable Call Forwarding on Busy Tone CCM Legacy Support	*90 to activate *91 to deactivate	Subscriber forwards calls to specified number while line is busy. Required subscriber action: <ul style="list-style-type: none"> • Press *90. • Listen for stutter tone. • Enter number to forward calls to while line is busy. • Hang up. • Press *91 to disable.
Variable Call Forwarding on No Answer CCM Legacy Support	*92 to activate *93 to deactivate	Subscriber forwards calls to specified number when there is no answer on line. Required subscriber action: <ul style="list-style-type: none"> • Press *92. • Listen for stutter tone. • Enter number to forward calls to if no answer. • Hang up. • Press *93 to disable.
Auto Recall	*69 to activate	On missed call, subscriber dials back the calling party. Required subscriber action: Press *69 to return last incoming call.
Auto Callback	*66 to activate	Redial the last number called. Required subscriber action: Press *66 to redial last called number.
Caller ID	*65 to activate *85 to deactivate	Display caller name or number to properly equipped telephone.
Selective Caller ID Blocking	*67 to activate per outgoing call	Subscriber prevents Caller ID from being sent on outgoing call. Required subscriber action: <ul style="list-style-type: none"> • Press *67. • Listen for stutter tone, followed by dial tone. • Enter number of party to whom call should be anonymous.
Complete Caller ID Blocking Override	*82 to activate per outgoing call	With Complete Caller ID Blocking Enabled, subscriber sends Caller ID in outgoing call (to bypass anonymous call rejection). Required subscriber action: <ul style="list-style-type: none"> • Press *82. • Listen for stutter tone, followed by dial tone. • Enter number of party to whom Caller ID should be visible.
Cancel Call Waiting	*70 to activate per outgoing call	Subscriber cancels call waiting for current call. Required subscriber action: <ul style="list-style-type: none"> • Press *70. • Listen for stutter tone, followed by dial tone. • Enter number of party to call without being disturbed by call waiting.

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Supported Call
Features and
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Customer Originated Trace CCM Legacy Support	*57 to activate per call	Subscriber requests trace information for nuisance/harassing call. Required subscriber action. <ul style="list-style-type: none"> • Hang up on unwanted caller. • Press *57. • Listen for stutter tone confirmation that trace request was issued.
Do Not Disturb CCM Legacy Support	*78 to activate *79 to deactivate	Subscriber stops incoming calls from ringing phone; calling party hears busy signal. Required subscriber action: <ul style="list-style-type: none"> • Press *78 • Listen for stutter tone. • Hang up phone to block all incoming calls from ringing. To deactivate: <ul style="list-style-type: none"> • Press *79. • Listen for stutter tone. • Hang up phone to allow incoming calls.
Speed Dialing 8 CCM Legacy Support	*74 followed by index 2-9	Subscriber configures 8 speed-dial numbers, allowing for X# calling. Required subscriber action: <ul style="list-style-type: none"> • Press *74. • Listen for stutter tone. • Enter speed-dial index (2-9). • Listen for stutter tone. • Enter desired party number to associate with speed-dial index. • Hang up. Subscriber can now call party by dialing X# (for example, 3#).
Speed Dialing 30 CCM Legacy Support	*75 followed by index 2-8	Subscriber configures 8 speed-dial numbers, allowing for XX# calling. Required subscriber action: <ul style="list-style-type: none"> • Press *75. • Listen for stutter tone. • Enter speed-dial index (20-39) • Listen for stutter tone. • Enter desired party number to associate with speed-dial index. • Hang up. Subscriber can now call party by dialing XX# (for example, 20#).

Modem Support

For modem support through the BAS, echo cancellation must be disabled prior to the call being placed by the modem. If echo cancellation is not disabled, the BAS cannot properly recognize the DTMF digits signaled by the modem.

To disable echo cancellation on a per call basis, the modem user must prepend the dial string with a *99. For example, if a subscriber uses a local access number of 123-1234 to for dial-up service to a national Internet provider, he or she must enter *991231234 in the connection dialog.



Chapter 8

Video Client/Server Configuration

This chapter details the commands used to enable support for middleware-enabled services that are provided to video clients connected to the BAS. Currently, Pannaway's products can send Caller ID information to the middleware server, which in turn is then sent to the video set top box/video client.

8.1 Contents of this Chapter

This chapter describes the video client-related commands supported on the BAS. The following information is presented in this chapter:

Topic	on page
Video Client and Server Configuration Commands	8-1

8.2 Video Client and Server Configuration Commands

The following commands are used to configure video client and middleware server information on the BAS.

Middleware Server Configuration Commands

The following commands configure communications with the middleware server.

```
middleware-server host {<host>}
```

Summary Identifies the middleware server host.

Required Mode Global Config

User Entered *<host>*

Parameters The IP address (in Dotted Decimal Notation) or fully qualified host name of the middleware server host machine.

Description This command identifies the middleware server that manages the set top box clients, interactive video services, billing and so forth.

"no" form middleware-server host {<host>}
The "no" form of this command deletes the middleware server information.

Defaults None

8.2

Video Client and
Server
Configuration
Commands**Example**

```
BASR(config)# middleware-server host midwareserver.acme.com
```

Related Commands middleware-server type {myrio | iview} on page 8-2
 middleware-server port {<0-9999>} on page 8-2
 middleware-server enable on page 8-3

middleware-server type {myrio | iview}

Summary Identifies the middleware server/video client vendor.

Required Mode Global Config

User Entered Parameters {myrio | iview}

The vendor providing middleware services/video client support. Currently, Pannaway's video partners include Myrio and Tut Systems' iView.

Description This command identifies the middleware server/video client vendor.

"no" form no middleware-server type
 The "no" form of this command sets the middleware server type back to its default state of undefined.

Defaults None (undefined)

Example

```
BASR(config)# middleware-server type myrio
```

Related Commands middleware-server host {<host>} on page 8-1
 middleware-server port {<0-9999>} on page 8-2
 middleware-server enable on page 8-3

middleware-server port {<0-9999>}

Summary Identifies the TCP/UDP port used to communicate with the middleware server.

Required Mode Global Config

User Entered Parameters <0-9999>

The TCP/UDP port number used for communications with the middleware server.

Description This command identifies the TCP/UDP port used to send the caller ID information to the middleware server.

By default Myrio uses port 3001 for communications with the middleware server, and Tut Systems' iView uses port 8999.

"no" form no middleware-server port
 The "no" form of this command sets the middleware server TCP/UDP port back to its default value of 0.

Defaults 0

Example

```
BASR(config)# middleware-server port 3001
```

Related Commands middleware-server host {<host>} on page 8-1
 middleware-server type {myrio | iview} on page 8-2
 middleware-server enable on page 8-3

8.2*Video Client and
Server
Configuration
Commands***middleware-server enable**

Summary Enables communications with the middleware server.

Required Mode Global Config

**User Entered
Parameters** None

Description This command enables or disables communications between the BAS and the middleware server.

“no” form no middleware-server enable
 The “no” form of this command disables communication with the middleware server.

Defaults Communications disabled

Example

```
BASR(config)# middleware-server enable
```

Related Commands middleware-server host {<host>} on page 8-1
 middleware-server type {myrio | iview} on page 8-2
 middleware-server port {<0-9999>} on page 8-2

**Video Client
Configuration
Commands**

The following commands configure the BAS to transmit caller ID messages to Set Top Boxes or inter-operating with Myrio middleware.



NOTE: These commands are currently only useful for demonstration purposes, as only four Set Top Box IP addresses can be configured per BAS (4 total, not 4 per port). This will be fixed in a future release of BAS firmware.



TIP: These commands can also be used with a video-enabled PC, running an application that transmits pop-ups in a video stream.

8.2

Video Client and
Server
Configuration
Commands

video-client caller-id enable

Summary Configures the transmission of caller ID information to the video client/set top box.

Required Mode Global Config

User Entered Parameters None.

Description This command enables or disables the transmission of Caller ID information from the BAS to the video client/set top box.

“no” form no video-client caller-id enable
The “no” form of this command disables transmission of Caller ID information from the BAS to the video client/set top box. This is the default state.

Defaults Caller ID transmission disabled.

Example

```
BASR(config)# video-client caller-id enable
```

Related Commands video-client ip-address {<ip address>} on page 8-4
video-client port {<0-9999>} on page 8-5
video-client type {myrio | iview} on page 8-5

video-client ip-address {<ip address>}

Summary Identifies the video client/set top box IP address.

Required Mode Global Config

User Entered Parameters *<ip address>*
The IP address of the video client/set top box in dotted decimal notation.

Description This command identifies the IP address of the video client/set top box to which Caller ID information will be displayed.

“no” form no video-client ip-address
The “no” form of this command sets the video client IP address back to its default setting of 0.0.0.0.

Defaults 0.0.0.0

Example

```
BASR(config)# video-client ip-address 172.16.4.99
```

Related Commands video-client caller-id enable on page 8-4
video-client port {<0-9999>} on page 8-5
video-client type {myrio | iview} on page 8-5

8.2

Video Client and
Server
Configuration
Commands

video-client port {<0-9999>}

Summary Identifies the TCP/UDP port used to communicate with the video client/set top box.

Required Mode Global Config

User Entered Parameters **<0-9999>**
The TCP/UDP port number used for communications with the video client.

Description This command identifies the TCP/UDP port used to send the caller ID information to the video client.

By default Myrio uses port 3000 for communications with the video client/set top box.

“no” form no video-client port
The “no” form of this command sets the video client TCP/UDP port back to its default value of 0.

Defaults 0

Example

```
BASR(config)# video-client port 8999
```

Related Commands video-client caller-id enable on page 8-4
video-client ip-address {<ip address>} on page 8-4
video-client type {myrio | iview} on page 8-5

video-client type {myrio | iview}



NOTE: This command is currently not applicable, as the only applicable video client type is Myrio.

8.2

Video Client and Server Configuration Commands



Chapter 9

IGMP and Multicast Commands

This chapter details the commands used to enable IGMP multicast support on the BAS, and view IGMP and multicast information.

9.1 Contents of this Chapter

The information in this chapter describes the use of the system CLI to perform BAS management. The following information is presented in this chapter:

Topic	on page
IGMP Configuration Commands	9-1
IGMP Monitoring Commands	9-4
Multicast Monitoring Commands	9-7
Multicast Over ADSL Commands	9-10

9.2 IGMP Configuration Commands

The following command controls IGMP snooping and IGMP Querying on the BAS.

`igmpsnooping enable`

Summary Enables IGMP snooping on the system.

Required Mode Global Config

User Entered Parameters None

Description This command enables IGMP snooping on the BAS. IGMP snooping allows the BAS to intelligently forward multicast traffic (often multicast video). The BAS forwards traffic only to ports that are enabled for IGMP and request the multicast traffic, so that network performance is not adversely affected by broadcasting.

IGMP requires an upstream router that learns about the presence of multicast groups on its subnets and keeps track of group membership. The Pannaway Technologies' BAR provides these multicast routing services.

9.2

IGMP
Configuration
Commands

NOTE: The IGMP application supports the following:

- Global activation and per-port configuration.
- Validation of the IP header checksum (as well as the IGMP header checksum) and discarding of the frame upon checksum error.
- Maintenance of the forwarding table entries based on the MAC address versus the IP address.

“no” form no igmpsnooping enable
The “no” form of this command disables IGMP snooping on the system.

Defaults Enabled

Example

```
BASR(config)# igmpsnooping enable
```

Related Commands show igmp on page 9-4

```
igmpquery {v1 | v2 | v3} enable
```

Summary Enables or disables IGMP querying on the system.

Required Mode Global Config

User Entered Parameters {v1/v2/v3}

The version of IGMP query message to send. All IGMP versions are backward compatible with earlier versions.

- **v1** – IGMP Version 1. Supports only membership queries and reports.
- **v2** – IGMP Version 2 (the default version). Adds support for “Leave” messages. Generally the most widely deployed IGMP version.
- **v3** – IGMP Version 3. Adds support for source filtering, which allows a multicast receiver to indicate to the router the groups it wants to receive traffic from, and the expected sources for that traffic. This has the advantage of further restricting multicast traffic and reducing network congestion. IGMP v3 is currently a proposed standard (see IETF RFC 3376), but it is widely supported. To benefit from deploying IGMP v3 on the network, the upstream multicast router must support IGMP v3 – therefore, there is no advantage to activating IGMP v3 queries unless the router also supports it.

Description In a multicast configuration, the router is responsible for querying the IGMP multicast clients to determine if a multicast stream (such as video) is still actively requested. If the stream is not requested, it is pruned to reduce network traffic flow. If you use a Pannaway Technologies’ BAR as the multicast router, it sends its query messages at 125 second intervals by default.

By default, the BAS also performs IGMP querying on its ADSL ports to keep up to date on multicast group membership. ADSL links can retrain causing multicast “leave” messages to be lost during the link transition; in addition, older set top boxes that only support IGMP v1 (or mis-configured set top boxes) will not transmit “leave” messages after switching channels. Having these stale multicast streams can cause the relatively low bandwidth ADSL link to be overburdened.

9.2

IGMP
Configuration
Commands

By default, the BAS issues these IGMP queries onto its ADSL ports at 15 second intervals. This allows it to more rapidly determine the state of multicast streams and prune inactive streams faster than relying on the BAR's (or other multicast router's) IGMP queries to prune inactive streams. It then forwards the group membership reports up to the BAR or other multicast router.

In large “flat” networks, however, a multicast router may be negatively impacted by processing the membership group messages forwarded by BAS switches at a frequent interval. In this case, network performance may be improved by disabling IGMP querying on the BAS and having the BAR (or other IGMP router) be the sole querier on the network.

“no” form no igmp-query enable
The “no” form of this command disables IGMP querying on the system, so that the BAR (or other upstream router) is the sole querier on the network.

Defaults IGMP querying enabled.

Example

```
BASR(config)# igmpsnooping enable
```

Related Commands show igmp on page 9-4

```
igmp enable { <port> | <port-range> }
```

```
igmp enable
```

Summary Enables IGMP snooping on a per-port level.

Required Mode Global Config or Interface Config

User Entered *<port>*

Parameters Selects an individual ADSL port on the BAS when the command is performed while in Global Config mode.

<port-range>

Selects a contiguous range of ADSL ports (for example 1-14 or 7-10) on the BAS when the command is performed while in Global Config mode.

Description This command enables IGMP snooping on an individual port or a range of BAS ADSL ports. IGMP snooping allows the multicast traffic (often multicast video) to be received on the port. The BAS forwards traffic only to ports that are enabled for IGMP and request the multicast traffic, so that network performance is not adversely affected by broadcasting.

“no” form no igmp enable { <port> | <port-range> }
no igmp enable
The “no” form of this command disables IGMP snooping on the selected ADSL port(s).

Defaults Disabled

Example

```
BASR(config)# interface adsl 4-7 igmp enable
BASR(config-if)# igmp enable
```

Related Commands show igmp on page 9-4

9.3*IGMP
Monitoring
Commands***9.3 IGMP Monitoring Commands**

The following commands are used to show multicast group and source information, display multicast statistics, and clear multicast statistics counters.

```
show igmp
```

Summary Displays the number of total IGMP multicast groups and static IGMP multicast groups, the current group membership information, and the operational state of multicast.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the number of active multicast groups with current membership information, including the multicast group IP address, the host receiver IP information, and the associated ADSL port for active members of each group.

It also displays the number of static IGMP multicast groups. Static multicast groups are those multicast group addresses that have been pre-defined on the BASR, and can not be deleted. These include 224.0.0.1 (all systems on the subnet), 224.0.0.2 (all routers on the subnet), 224.0.0.4 (all DVMRP routers on the subnet), 224.0.0.9 (all RIP 2 routers on the subnet) and the broadcast address (255.255.255.255). In addition, there is a multicast address (224.204.204.204) that is reserved for Pannaway-proprietary future use.

Example

BASR# show igmp

```

IGMP Ports Enabled

 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

IGMP Statistics

Joins                                Leaves
IGMPv1:                             0                                NA
IGMPv2:                            95794                            3083
IGMPv3:                            3024                             4

Queries

Received                                Sent
IGMPv1:                             0                                NA
IGMPv2:                             0                                0
IGMPv3:                            1620                            Tagged 63152
                                           0
                                           Tagged 0

IGMP Query Version: v2
Upstream Querier on GigE 2.
IGMP snooping is enabled.

IGMPv3 Add Sources Requests           0
IGMPv3 RemoveSources Requests         0
IGMPv3 Membership Reports Received    1519

Probes                                DVMRP Grafts                                Prunes
0                                     0                                     0

```

9.3**IGMP
Monitoring
Commands**

Command Output This command displays the following output. Note that statistics not supported by IGMP version 1 are listed as NA.

IGMP Ports Enabled	The ADSL ports on which IGMP is enabled.
Received	Total number of valid IGMP packets received.
Discards	Total number of IGMP packets discarded that were invalid because of an unknown type or format.
IGMPv1 Join	Number of IGMP version 1 Join requests received.
IGMPv2 Join	Number of IGMP version 2 Join requests received.
IGMPv3 Join	Number of IGMP version 3 Join requests received.
IGMPv2 Leave	Number of IGMP version 2 Leave requests received.
IGMPv3 Leave	Number of IGMP version 3 Leave requests received.
IGMPv1 Queries Received	Total number of IGMP version 1 general and group-specific queries received.
IGMPv2 Queries Received	Total number of IGMP version 2 general and group-specific queries received.

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IGMP
Monitoring
Commands

IGMPv3 Queries Received	Total number of IGMP version 3 general and group-specific queries received.
IGMPv2 Queries Sent	Total number of IGMP version 2 general and group-specific queries sent, including the number of queries “Tagged” by a tag switching multicast router to associate the query with a particular multicast tree.
IGMPv3 Queries Sent	Total number of IGMP version 3 general and group-specific queries sent, including the number of queries “Tagged” by a tag switching multicast router to associate the query with a particular multicast tree.
IGMP Query Version	The IGMP version of Membership Query messages transmitted by the BAS: v1, v2, or v3. If there is a mixture of IGMP v2 and v3 routers on the network, the lowest version of IGMP present on the network must be used for query messages.
Upstream Querier on Gig	Indicates which Gigabit Ethernet interface (1 or 2) is acting as the upstream querier.
IGMP operation	Indicates whether IGMP is currently enabled or disabled, whether an upstream querier is present, and the version of IGMP query being issued by the BAS.
IGMPv3 Add Sources Requests	Total number of IGMPv3 Membership Report messages received by the BAS with a group record that requested new source addresses be added to an Include/Exclude Source List.
IGMPv3 Remove Sources Requests	Total number of IGMPv3 Membership Report messages received by the BAS with a group record indicating source addresses to be removed from an Include/Exclude Source List.
IGMPv3 Membership Reports Received	Total number of IGMPv3 Membership Report messages received by the BAS.
DVMRP Probes	Number of IGMP-like query requests embedded in DVMRP updates.
DVMRP Grafts	Number of IGMP-like requests embedded in DVMRP updates.
DVMRP Prunes	Number of IGMP-like requests embedded in DVMRP updates.

Related Commands igmpsnooping enable on page 9-1
clear igmp-stats on page 9-6

clear igmp-stats

Summary Resets IGMP statistics counters to zero.

Required Mode Privileged Exec

User Entered Parameters None

Description This command resets IGMP statistics counters to zero.



NOTE: IGMP statistics counters are also cleared on a system reset.

Example

```
BASR# clear igmp-stats
About to clear all IGMP statistics, continue (yes/no)? y
```

Related Commands show igmp on page 9-4

9.4*Multicast
Monitoring
Commands***9.4 Multicast Monitoring Commands**

The following commands are used to show multicast group information.

```
show multicast { static <vlan id> | dynamic <start port> <end port> | all }
```

Summary Display information about static and dynamic multicast groups supported by the BAS.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered { static / dynamic / all }

Parameters Determines the multicast group address information to display:

- If static is selected, only static multicast group information is displayed (including the pre-defined static multicast groups). Static multicast groups are those multicast group addresses that have been pre-defined on the BASR, and can not be deleted. These include 224.0.0.1 (all systems on the subnet), 224.0.0.2 (all routers on the subnet), 224.0.0.4 (all DVMRP routers on the subnet), 224.0.0.9 (all RIP 2 routers on the subnet) and the broadcast address (255.255.255.255). In addition, there is a multicast address (224.204.204.204) that is reserved for Pannaway-proprietary future use.

This option takes the VLAN ID argument.

- If dynamic is selected, information is only shown for multicast groups that have been dynamically created.

This option takes the start and end port arguments.

- If all is selected, information is shown for both static and dynamic multicast groups on all ports.

<vlan id>

If viewing static multicast group information, this specifies the VLAN for which to view static groups. The start port and end port must be separated by a space (not a dash).

<start port> <end port>

If viewing dynamic multicast group information, this specifies the port range for which to view dynamic groups. The start port and end port must be separated by a space (not a dash).

Description This command displays static and dynamic multicast group information, including the IP address of the multicast source, the MAC address associated with the multicast source, the multicast group IP and MAC address, and the VLAN associated with the multicast stream.

Example

```
BASR# show multicast all
```

```
Static Groups:
```

Group IP	Group MAC
255.255.255.255	ff:ff:ff:ff:ff:ff
224.0.0.1	01:00:5e:00:00:01
224.0.0.2	01:00:5e:00:00:02
224.0.0.4	01:00:5e:00:00:04
224.0.0.9	01:00:5e:00:00:09
224.204.204.204	01:00:0c:cc:cc:cc

```
Dynamic Groups:
```

```
Port 10
```

```
Service Domain: 2
```

```
VLAN: 30 VLAN Name:
```

Host IP	Host MAC	Group IP	Group MAC
10.98.0.72	00:04:23:15:75:49	224.15.15.14	01:00:5e:0f:0f:0e

```
Port 10
```

```
Service Domain: 3
```

```
VLAN: 30 VLAN Name:
```

Host IP	Host MAC	Group IP	Group MAC
10.98.0.72	00:04:23:15:75:49	239.255.255.250	01:00:5e:7f:ff:fa

```
Port 17
```

```
Service Domain: 3
```

```
VLAN: 30 VLAN Name:
```

Host IP	Host MAC	Group IP	Group MAC
10.98.0.71	00:04:23:25:eb:26	239.255.255.250	01:00:5e:7f:ff:fa
10.98.0.71	00:04:23:25:eb:26	224.17.17.17	01:00:5e:11:11:11

9.4**Multicast
Monitoring
Commands**

9.4

Multicast
Monitoring
Commands

```
BASR# show multicast dynamic 10 17
```

```
Port 10
```

```
Service Domain: 2
```

```
VLAN: 30 VLAN Name:
```

Host IP	Host MAC	Group IP	Group MAC
10.98.0.72	00:04:23:15:75:49	224.15.15.14	01:00:5e:0f:0f:0e

```
Port 10
```

```
Service Domain: 3
```

```
VLAN: 30 VLAN Name:
```

Host IP	Host MAC	Group IP	Group MAC
10.98.0.72	00:04:23:15:75:49	239.255.255.250	01:00:5e:7f:ff:fa

```
Port 17
```

```
Service Domain: 3
```

```
VLAN: 30 VLAN Name:
```

Host IP	Host MAC	Group IP	Group MAC
10.98.0.71	00:04:23:25:eb:26	239.255.255.250	01:00:5e:7f:ff:fa
10.98.0.71	00:04:23:25:eb:26	224.17.17.17	01:00:5e:11:11:11

```
No groups
```

```
BASR# show multicast static 4066
```

Group IP	Group MAC
255.255.255.255	ff:ff:ff:ff:ff:ff
224.0.0.1	01:00:5e:00:00:01
224.0.0.2	01:00:5e:00:00:02
224.0.0.4	01:00:5e:00:00:04
224.0.0.9	01:00:5e:00:00:09
224.204.204.204	01:00:0c:cc:cc:cc

Command Output This command displays the following output for static multicast groups:

Group IP	The IP address of the pre-defined static multicast group. Reserved Multicast IP addresses are in the range 224.0.0.0 to 224.0.0.255, as well as the broadcast group (255.255.255.255).
Group MAC	The layer 2 MAC address of the pre-defined static multicast group, including the broadcast group (FF-FF-FF-FF-FF-FF). Multicast MAC addresses are converted from the layer 3 group IP address.

This command displays the following output for dynamic multicast groups:

Port	The ADSL port on which the multicast group member is detected.
Service Domain	The service domain on which the multicast group member is detected.
VLAN	The VLAN ID of the VLAN with which the multicast group member is associated.
VLAN Name	The name of the VLAN with which the multicast group member is associated.
Host IP	The unicast IP address of the multicast source station.
Host MAC	The unique layer 2 MAC address of the multicast source station.
Group IP	The IP address of the dynamic multicast group.
Group MAC	The layer 2 MAC address of the dynamic multicast group. Multicast MAC addresses are converted from the layer 3 group IP address.

Related Commands igmpquery {v1 | v2 | v3} enable on page 9-2

9.5 Multicast Over ADSL Commands

With revision 2.1 of the BAS, specified multicast streams were permitted to be transmitted from a downstream ADSL source. In prior versions of BAS firmware, multicast traffic was only allowed to be transmitted via the gigabit Ethernet ports. With BAS revision 2.2, the command has been changed slightly to specify the particular port and service domain on which the source can transmit (in 2.1, the source was only specified by IP address, and no ADSL port information was required).

```
configure interface adsl {<port>} service domain {<1-6>} multicast-source {<multicast ip-address>}
```

Summary Specify a multicast group IP address that is permitted to be transmitted via a specific ADSL port and service domain from a downstream multicast source.

Required Mode Interface Config

User Entered <port>

Parameters The ADSL port through which the multicast source is permitted to transmit.

<1-6>

The service domain on which the multicast source is permitted to transmit.

<multicast ip-address>

A multicast address that is allowed to be transmitted from a source connected to the specified ADSL port and service domain. In general, this should be a limited/administratively scoped address in the 239.0.0.0/8 range (see RFC 2365), which allows for local multicast applications that are not forwarded outside of the provider's administrative boundary/domain.

Description This command specifies a multicast group IP address that is permitted to be transmitted via an ADSL port/service domain from a downstream multicast source. Up to 64 multicast group addresses can be allowed from downstream sources connected to the ADSL ports.

9.5

Multicast Over ADSL Commands

“no” form no configure interface adsl {<port>} service domain {<1-6>} multicast-source {<multicast ip-address>}

The “no” form of this command deletes the specified multicast group IP address from the list of allowed downstream multicast sources on the given port and service domain.

Example

```
10.11.2.7(config-if)# service-domain 5 multicast-source 239.255.15.100
```

Related Commands show multicast-source on page 9-11

show multicast-source

Summary Displays all multicast IP addresses that are permitted to be sourced from an ADSL port, and their associated ADSL port and service domain information.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the multicast IP addresses that are allowed to be transmitted by a downstream source connected to an ADSL port.

Example

```
BASR(config)# show multicast-source
224.0.0.9
239.255.255.250
239.255.15.20
239.255.15.100
```

Related Commands configure interface adsl {<port>} service domain {<1-6>} multicast-source {<multicast ip-address>} on page 9-10
show interface stats atm <port> on page 6-77

9.5

Multicast Over
ADSL
Commands

9.5

Multicast Over ADSL Commands



Chapter 10

IP Routing Table and MAC Address Table Commands

This chapter details the commands used to configure the BAS's IP routing table and IP ARP table, and display contents of the MAC address table.

10.1 IP Routing Table Commands

Use the following commands to configure the IP Routing and IP ARP tables on the BASR, and view those tables.

```
ip route {<destination ip> <gateway ip-address> <subnet-mask>}
```

Summary Adds a static route to the BAS's IP Route table.

Required Mode Global Config

User Entered Parameters *<destination ip>*

The IP address of the destination network or host, entered in dotted decimal notation (nnn.nnn.nnn.nnn, where the value of nnn ranges from 0-254).

<gateway ip>

The IP address of the gateway or router to be used when forwarding packets to this destination, entered in dotted decimal notation (nnn.nnn.nnn.nnn, where the value of nnn ranges from 1-254).

<subnet-mask>

The subnet mask to be associated with this route entry, entered in dotted quad notation (NNN.NNN.NNN.NNN, where the value of NNN ranges from 0-255).

Description This command adds a static route to the IP Route table, using the specified destination, gateway IP to use to that destination, and subnet mask to associate with the route.

"no" form no ip route {<destination ip-address> <gateway ip-address> <subnet-mask>}

Defaults None

Example

```
BASR# configure ip route 192.168.1.0 192.168.1.55 255.255.255.0
```

Related Commands show ip route on page 10-2

10.1

IP Routing Table
Commands

```
ip arp {<ip-address> <mac-address>}
```

Summary Adds a permanent entry to the IP ARP table.

Required Mode Global Config

User Entered Parameters *<ip-address>*

The IP address for the ARP entry, entered in dotted decimal notation (nnn.nnn.nnn.nnn, where the value of nnn ranges from 1-254).

<mac-address>

The MAC layer address for the ARP entry, entered in hex format (six hexadecimal bytes, separated by colons).

Description This command enters a permanent entry to the IP ARP table, using a specified IP address and MAC address pair. Permanent entries are not aged out of the ARP table.

“no” form no ip arp {<ip-address> <mac-address>}
The “no” form of this command deletes the specified ARP entry.

Defaults None

Example

```
BASR(config)# ip arp 145.17.36.115 00:00:1d:a4:3c:5a
```

Related Commands show ip arp on page 10-3

```
show ip route
```

Summary Displays the contents of the IP routing table.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the contents of the IP routing table.

Example

```
BASR(config)# show ip route
```

Destination	Mask	Gateway	Flags	RefCnt	Use	Interface
0.0.0.0	0	10.11.4.1	103	4	0	wpEnd0
10.1.4.100	0	10.11.4.1	ffffc0070		1	wpEnd0
10.11.4.0	ffffff00	10.11.4.5	101	1	0	wpEnd0
32.32.32.10	0	10.11.4.1	ffff80071		2851	wpEnd0
127.0.0.1	0	127.0.0.1	5	0	0	lo0
172.16.1.35	0	10.11.4.1	ffffc0070		32	wpEnd0
172.16.1.163	0	10.11.4.1	ffff80071		1105	wpEnd0
192.168.55.0	ffffff00	192.168.55.55	101	0	0	voice0
192.168.55.4	ffffff00	192.168.55.55	4c01	1	49	voice0

Command Output Performing this command displays the following output:

Destination	The destination host or network IP address.
Mask	The subnet mask associated with the route, displayed in hex format (six bytes, each with a hex value from 00 to FF).
Gateway	The IP address of the gateway or router used to reach the destination.
Flags	A decimal value of the flags specified for a given route. For example, the flags entries in the example above values of 3 (1+2 – indicating that the route is usable and is a gateway), 5 (4+1 – indicating a usable, host-specific route entry), and 101 (100+1 – indicating that this route generates new route on use, and that it is usable). The following is a list of currently available flag values: 1 - route is usable (that is, “up”) 2 - destination is a gateway 4 - host specific routing entry 8 - host or net unreachable 10 - created dynamically (by redirect) 20 - modified dynamically (by redirect) 40 - message confirmed 80 - subnet mask present 100 - generate new routes on use 200 - external daemon resolves name 400 - generated by ARP 800 - manually added (static) 1000 - just discard packets (during updates) 2000 - modified by management protocol 4000 - protocol specific routing flag 8000 - protocol specific routing flag
Refcnt	The current number of active uses for the route. Connection-oriented protocols hold on to a single route for the duration of a connection; connectionless protocols obtain routes in the process of sending to a destination.
Use	A count of the number of packets sent using this route.
Interface	The interface with which the route is associated: wpEnd0 (the Wintegra WinPath Network Processor), l0 (the loopback interface), or voice0 or voice1 (the voice DSP interface).

10.1

IP Routing Table Commands

Related Commands `ip route {<destination ip> <gateway ip-address> <subnet-mask>}` on page 10-1

```
show ip arp
```

Summary Displays the IP ARP table that shows Internet-to-MAC (physical layer) address mappings.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the IP ARP table that shows Internet-to-MAC (physical layer) address mappings.

Example

```
BASR(config)# show ip arp
```

destination	gateway	flags	Refcnt	Use	Interface
10.11.4.1	00:0a:9f:50:08:2a	ffff8405	5	0	wpEnd0
192.168.55.4	00:0a:9f:40:00:e6	4c01	1	239	voice0

Command Output Performing this command displays the following output:

destination	The destination host IP address.
gateway	The MAC address of the gateway used when forwarding packets to the above destination IP.
Flags	<p>A decimal value of the flags specified for a given route. For example, the first ARP entry in the example above has a flag value of 405 (400+4+1), indicating it was generated by ARP, is host-specific, and that the route to the host is usable (up). The following is a list of currently available flag values:</p> <ul style="list-style-type: none"> • 1 - route is usable (that is, "up") • 2 - destination is a gateway • 4 - host specific routing entry • 8 - host or net unreachable • 10 - created dynamically (by redirect) • 20 - modified dynamically (by redirect) • 40 - message confirmed • 80 - subnet mask present • 100 - generate new routes on use • 200 - external daemon resolves name • 400 - generated by ARP • 800 - manually added (static) • 1000 - just discard packets (during updates) • 2000 - modified by management protocol • 4000 - protocol specific routing flag • 8000 - protocol specific routing flag
Refcnt	The current number of active uses for the route. Connection-oriented protocols hold on to a single route for the duration of a connection; connectionless protocols obtain routes in the process of sending to a destination.
Use	A count of the number of packets sent using this route.
Interface	The interface on which the ARP entry was detected: wpEnd0 (the Wintegra WinPath Network Processor), or voice0 or voice1 (the voice DSP interface).

Related Commands `ip arp {<ip-address> <mac-address>}` on page 10-2

10.1

IP Routing Table
Commands

10.2 MAC Address Table Commands

The BAS dynamically learns each source MAC address communicating through each gigabit Ethernet and ADSL interface and stores the address record in a source address table – also known as the filtering database table.

A learned source MAC address record remains in the table for eight hours; after that period it is aged (cleared) out of the table, although it may immediately be relearned if it is still communicating through a port.

The source address table is updated every minute, and all entries whose eight hour aging time has expired are flushed from the table.

You can view the contents of the MAC address table that displays the physical (MAC) addresses communicating through each port on the BAS. In addition, you can use MAC address table commands to clear the contents of the MAC address table prior to configuring MAC or IP locking on the BAS.

Use the following commands to display or clear the contents of the MAC address table.

10.2

MAC Address Table Commands

```
show mac-address-table gig-ethernet {<port>}
```

Summary Displays the MAC addresses communicating through a specified gigabit Ethernet port.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters <port>

The <port> parameter is the index number of the gigabit Ethernet port (1 or 2).

Description This command displays the source MAC addresses communicating through a specified gigabit Ethernet port, as stored in the BAS's dynamic MAC address table (addresses learned by monitoring traffic).



NOTE: The BAS host MAC address and voice DSP MAC address are static and are never aged out of the table.

Example

```
BASR# show mac-addr-table gig-ethernet 1
00:0a:9f:40:03:28
00:0a:9f:50:07:e2
00:02:02:02:18:b2
00:0a:9f:00:21:72
00:02:02:02:1a:e3
```

Command Output This command displays the physical (MAC) address of each host communicating through the gigabit Ethernet port.

Related Commands show mac-addr-table all on page 10-7
clear mac-addr-table gig-ethernet {<port>} on page 10-9

```
show mac-addr-table adsl {<port-range> <domain-range>}
```

10.2

MAC Address Table Commands

Summary Displays the MAC addresses currently learned for a specified ADSL port and service domain.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters **<port>**
The ADSL port (1-48) for which to display MAC addresses in the source address table.

<service-domain>

The selected service domain (virtual channel) indexed 1–6, for which to display MAC addresses.

<port-range>

The range of ports for which to display source address table entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to display source address table entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

all

Display MAC address entries in the source address table of all ports and service domains on the BAS.

Description This command displays MAC addresses currently in the source address table that have been detected on the specified ADSL port and service domain. The output provides a list of MAC addresses, listed in the order that they have been detected in the source address table.

Example

```
10.11.2.7# show mac-addr-table adsl 1-3 1-2
```

```
Port: 1    Service Domain: 1
```

```
00:02:02:02:18:b2
```

```
Port: 1    Service Domain: 2
```

```
No learned MACs
```

```
Port: 2    Service Domain: 1
```

```
00:02:02:02:1a:e3
```

```
Port: 2    Service Domain: 2
```

```
No learned MACs
```

```
Port: 3    Service Domain: 1
```

```
No learned MACs
```

```
Port: 3    Service Domain: 2
```

```
No learned MACs
```

Related Commands mac-lock enable on page 4-7
 show mac-addr-table all on page 10-7

```
show mac-addr-table all
```

Summary Displays all MAC addresses communicating through the BAS's gigabit Ethernet ports and ADSL ports.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the source MAC addresses communicating through all ADSL ports and service domains and gigabit Ethernet ports on the BAS.



NOTE: The BAS host MAC address and voice DSP MAC address are static and are never aged out of the table.

10.2

MAC Address Table Commands

10.2

MAC Address
Table
Commands**Example**

```

BASR# show mac-addr-table all

Port: 1   Service Domain: 1
00:02:02:02:18:b2
Port: 1   Service Domain: 2
No learned MACs
Port: 1   Service Domain: 3
No learned MACs
Port: 1   Service Domain: 4
No learned MACs
Port: 1   Service Domain: 5
No learned MACs
Port: 1   Service Domain: 6
No learned MACs

-----
Remaining ADSL ports cut for example purposes
-----

Gigabit Ethernet Port 1:
00:0a:9f:40:03:28
00:0a:9f:50:07:e2
00:02:02:02:18:b2
00:0a:9f:00:21:72
00:02:02:02:1a:e3

Gigabit Ethernet Port 2:
No learned MACs

```

Command Output This command displays the physical (MAC) address of each Ethernet host communicating through all gigabit Ethernet ports and ADSL ports/service domains on the BAS.

Related Commands show mac-address-table gig-ethernet {<port>} on page 10-5
 show mac-addr-table adsl {<port-range> <domain-range>} on page 10-6
 clear mac-addr-table gig-ethernet {<port>} on page 10-9
 clear mac-addr-table adsl {<port-range> <domain-range>} on page 10-9

10.2

MAC Address
Table
Commands

```
clear mac-addr-table gig-ethernet {<port>}
```

Summary Delete source MAC address table entries for a selected gigabit Ethernet port.

Required Mode Global Config

User Entered Parameters *<port>*

The *<port>* parameter is the index number of the gigabit Ethernet port (1 or 2).

Description This command deletes the contents of the MAC address table with respect to the selected gigabit Ethernet port.



NOTE: The BAS host MAC address and voice DSP MAC address are static and can't be deleted from the source MAC address table.

Example

```
BASR# clear mac-addr-table gig-ethernet 2
```

Related Commands show mac-address-table gig-ethernet {<port>} on page 10-5
show mac-addr-table all on page 10-7

```
clear mac-addr-table adsl {<port-range> <domain-range>}
```

Summary Delete source MAC address table entries for a selected range of ADSL ports and service domains.

Required Mode Global Config

User Entered Parameters *<port-range>*

The range of ports for which you want to clear MAC address table entries, where the start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The range of service domains (for the above port range) for which to clear MAC address table entries, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

Description This command deletes the contents of the MAC address table with respect to the selected ADSL port range and service domain range. This command is useful to perform prior to configuring MAC or IP locking on ADSL ports to ensure that the MAC address information is up to date prior to locking the port on the first detected address.

Example

```
BASR# configure mac-lock enable
```

10.2

MAC Address Table Commands

Related Commands show mac-addr-table adsl {<port-range> <domain-range>} on page 10-6
show mac-addr-table all on page 10-7
mac-lock enable on page 4-7
configure mac-lock first {<port-range> <domain-range>} on page 4-8
configure interface adsl {<port>} service-domain {<1-6>} ip-lock {<source ip-address>}
[<source mac-address>] on page 4-17



Chapter 11

Segregating and Prioritizing Services on the BAS

11.1 Contents of this Chapter

This chapter describes the commands that configure and manage Virtual Local Area Networks (VLANs) of various types on the Pannaway BAS. The following sections are presented in this chapter:

Topic	on page
Service Segmentation and Prioritization Overview	11-1
VLAN and Service Domain Configuration Commands	11-3
Special VLAN Configuration Commands	11-13
VLAN and Service Domain Show Commands	11-17

11.2 Service Segmentation and Prioritization Overview

BAS version 2.2.x allows you to create multiple virtual channels (VCs) over a single ADSL link, and map those channels to IEEE 802.1Q Virtual Local Area Networks (VLANs). Each ADSL port can support up to six VCs, and participate in up to 10 VLANs (one of which must be the management VLAN).

Service Domains

By default, each ADSL port has six logical sub-interfaces, indexed 1–6, that are termed “service domains” in the command line interface. Each of these service domains has a corresponding strict transmission priority. If a packet is in queue for transmission on service domain 1, it will be sent before any packet queued for service domain 2, 3, 4, 5, or six, and so on down the hierarchy.



TIP: There are actually four transmit queues used for the six service domains. Service domains 1, 2, and 3 map to the first three transmit queues; service domains 4, 5, and 6 share the last transmit queue – although each service domain (4, 5, or 6) is still serviced in hierarchical order on the same transmit queue.

11.2

Service Segmentation and Prioritization Overview

Default and Optional VLAN Configuration

All ports on the BAS are members of one or more VLANs. For release 2.2.x, there are six default VLANs that correspond to the six service domains. These default VLANs (with VLAN IDs of 4060–4065) can't be deleted or given a different VLAN ID. VLAN 4062 is the default management VLAN and is mapped to ADSL service domain 3; VLANs 4060, 4061, 4063, 4064, and 4065 are mapped to the remaining ADSL service domains (1, 2, 4, 5, and 6). The table below provides a synopsis of the default configuration of service domains and VLANs on the BAS, including the VPI/VCI used for the service domain connection, and the hardware transmit queue.

Table 11-1. Default Service Domain/VLAN Configuration

Service Domain	Default VLAN	Default VPI/VCI	Tx Queue
Service Domain 1	4060	0/37	1
Service Domain 2	4061	0/36	2
Service Domain 3	4062 (default management VLAN)	0/35	3
Service Domain 4	4063	0/38	4
Service Domain 5	4064	0/39	4
Service Domain 6	4065	0/40	4

You can create up to four additional VLANs, using any VLAN ID, for data traffic. These optional VLANs can be assigned to any service domain on any ADSL port. For example, if one of your subscribers wanted additional VLANs for LAN extension services, those VLANs could be assigned to a service domain in addition to the default VLANs.

Because the gigabit Ethernet ports, data (host) port, and voice DSP port (when assigned to the data network) must be members of all VLANs, they are automatically included in the default VLANs and in any additional VLANs that you create. If the voice DSP port is assigned to the Voice VLAN, it is not included in any other VLAN.

Packet Priority

In the downstream direction (from the gigabit Ethernet ports to the ADSL CPE), there is a fixed packet type priority enforced. Packets received by the gigabit Ethernet port are sent to the ADSL ports in the following transmit queue order:

- Control packets (IGMP multicast signaling)
- Voice over IP packets
- Data packets (non-multicast and voice). Data packets can be further prioritized by the use of filtering rules, as defined in “Configuring a Filtering Rule on Ports” on page 12-3.
- Video packets (IGMP multicast)
- Unknown multicast (IGMP multicast flooding)

When a packet is received by the ADSL port, it is first prioritized by service domain, and then by its packet type priority. For example, the lowest priority packet (unknown multicast) on service domain 2 is transmitted before the highest priority packet (IGMP control) on service domain 3.

For this reason, you should map your VLANs to the ADSL service domains in order of packet importance. In general, you will want your critical network management traffic to use service domain 3, your delay-sensitive voice traffic to use service domain 2, multicast video to use service domain 3, and best-effort data traffic to use service domains 4–6.

11.3

VLAN and Service Domain Configuration Commands

Special VLAN Types

Release 2.2 of the BAS introduces several VLANs that support specialized services. These VLANs include:

- **EAPS VLAN** – EAPS (Ethernet Automatic Protection Switching) is a technology designed to enable rapid recovery in Ethernet fiber ring topologies, in the event of fiber cuts. The technology relies on communications between a single “Master” node and multiple “Transit” nodes that use a special protected VLAN to rapidly detect and isolate ring faults. For more information on EAPS, refer to *Chapter 14, “Ethernet Automatic Protection Switching”*.
- **MAC Forced Forwarding VLAN** – MAC Forced Forwarding is a security technology that prevents subscribers from direct communications across a Layer 2 switched Ethernet Network. A MAC Forced Forwarding VLAN is used to separate subscriber traffic, and ensure that all subscriber communications goes through an authorized Access Router (so that there is no direct subscriber-side address resolution between Ethernet hosts). For more information on MAC Forced Forwarding, refer to “configure vlan {<vlanid>} mac-forced-forward primary {<AR_mac_addr>} {<AR_ip_addr>}” on page 11-14.

The Secure Forced Forward VLAN is a related VLAN that adds extra security by preventing hosts within the same premises network from directly communicating with each other.

- **Q-in-Q VLAN** – Q-in-Q is the encapsulation of IEEE 802.1Q VLAN tags within a “container” 802.1Q VLAN, so that a single VLAN can support subscribing customers who have multiple VLANs. The use of Q-in-Q preserves the availability of VLAN IDs in the provider network, and keeps traffic in different customer VLANs segregated. For more information on Q-in-Q VLANs, refer to XREFHERE.

In addition to these specialized VLANs, the Voice VLAN was introduced in a previous BAS release. Note that once a VLAN ID has been designated for a special-purpose VLAN, it is excluded from any other VLAN usage. In addition, none of the six default VLANs (with IDs of 4060-4065) can be used as a special-purpose VLANs.

11.3 VLAN and Service Domain Configuration Commands

Use the following commands to configure VLANs and ADSL service domains.

General VLAN Configuration Commands

The following commands are used to create VLANs, and specify the network management VLAN.

```
configure network mgmt_vlan {<vlanid>}
```

Summary Set the management VLAN ID.

Required Mode Privileged Exec, Global Config

User-Entered Parameters <vlanid>

A numerical valid VLAN identification number. The range for this field is 1-4094.

11.3

VLAN and
Service Domain
Configuration
Commands

Description This command configures the Management VLAN ID. The Management VLAN ID may have the value 1 to 4094; the default value is 4062.

The Management VLAN should be used for network control and administration (web management, Telnet sessions, NMS management and so forth). The following is the default configuration of the BAS with respect to the management VLAN:

- The Management VLAN ID is assigned by default to the gigabit Ethernet ports as their Port VLAN ID (PVID). You can change this assignment via the “configure interface gigabit-ethernet {<port>} vlan {<vlanid>}” command.
- The Management VLAN ID always applies to the host port that is assigned the “data” IP address. This assignment cannot be changed.
- If there is no voice VLAN, the Management VLAN ID always applies to the DSP port that is assigned the “voice” IP address. This assignment cannot be changed.
- By default, the Service Domain 3 channel (logical bridge port) of each ADSL interface is assigned the Management VLAN ID of 4062. If you change the management VLAN from its default value (4062) *and* you want the ADSL ports to remain as members of the management VLAN, you must either:
 - Configure the Port VLAN ID (PVID) of a service domain on each port to be the same as the new Management VLAN ID. This does not have to be service domain 3 (although service domain 3 is recommended).
 - Configure a service domain to participate in the management VLAN. Again, this does not have to be service domain 3 (although service domain 3 is recommended).

“no” Form no configure network mgmt_vlan {<vlanid>
The “no” form of the command sets VLAN 4062 as the management VLAN ID, and removes the management VLAN setting from the previously specified VLAN ID. The previously specified VLAN ID remains; however, it no longer functions as the management VLAN.

Defaults VLAN ID: 4062

Example

```
BASR(config)# network mgmt_vlan 2
```

Related Commands configure vlan {<vlanid>} on page 11-4

configure vlan {<vlanid>}

Summary Create a new VLAN.

Required Mode Privileged Exec, Global Config

User-Entered Parameters <vlanid>
A numerical valid VLAN identification number. The range for this field is 1-4094.

Description This command creates a new VLAN in the BAS VLAN database and assigns it an ID.

“no” Form no vlan {<vlanid>}
The “no” form of the command deletes an existing VLAN, as specified by its <vlanid>.



NOTE: None of the default VLANs listed below can be deleted. An error message appears if you attempt to delete a default VLAN.

In addition, a VLAN cannot be deleted if it is assigned to an ADSL port's service domain as either a port VLAN (PVID) or participating VLAN. You must remove the VLAN assignment from all ports before being able to successfully delete the VLAN.

Defaults The following VLANs are created by default on the BAS. They cannot be deleted.

- 4060 (service domain 1)
- 4061 (service domain 2)
- 4062 (the default Management VLAN ID – used for service domain 3)
- 4063 (service domain 4)
- 4064 (service domain 5)
- 4065 (service domain 6)

Example

```
BASR(config)# vlan 3
```

Related Commands show service-domains {<port>} on page 11-18
 configure interface adsl {<port>} service domain {<1-6>} vlan {<vlanid>} on page 11-10
 configure interface adsl {<port>} service-domain {<1-6>} vlan-participation {<vlanid>} on page 11-13

```
configure vlan {<vlanid>} name {<text_string>}
```

Summary Assign a name to an existing VLAN.

Required Mode Privileged Exec, Global Config

User-Entered Parameters **<vlanid>**
 A numerical valid VLAN identification number. The range for this field is 1-4094.

<text_string>

A text string describing the VLAN for local reference purposes only. The string length can be from 0-32 characters. Note that you must enclose the description in quotation marks if there are spaces in the description (for example, "mcast video 1 VLAN").

Description This command assigns a name to a given VLAN. This name is only used for reference purposes in local and remote management; it cannot be used as a command-line identifier of the VLAN.

"no" Form no configure vlan {<vlanid>} name
 The "no" form of the command deletes an existing VLAN name.

Defaults VLAN Name: Not configured

Example

```
BASR(config)# vlan 4060 name "Serv Dom 1 VLAN"
```

Related Commands show vlan [<vlanid>] on page 11-17

11.3

VLAN and Service Domain Configuration Commands

11.3

VLAN and
Service Domain
Configuration
Commands**Gigabit Ethernet
VLAN Commands**

Use the following command to configure the gigabit Ethernet ports for VLAN tagging of egress traffic, and to assign a Port VLAN Identifier (PVID) to the ports. The gigabit Ethernet ports are automatically included in all VLANs created on the BAS.

```
configure interface gigabit-ethernet {<port>} vlan {<vlanid>}
```

Summary Configures the port VLAN identifier for a gigabit Ethernet port.

Required Mode Interface Config

**User-Entered
Parameters** *<port>*

The *<port>* parameter is the index number of the gigabit Ethernet port: 1 or 2.

<vlanid>

A numerical valid VLAN identification number. The range for this field is 1-4094.

Description This command specifies the port VLAN ID for a gigabit Ethernet interface. By default, the gigabit Ethernet port uses the network management VLAN ID as its PVID; however, you have the option of changing the PVID with this command.

The PVID is used for the purposes of VLAN tagging when a packet is received on that port.

“no” Form no configure interface gigabit-ethernet {<port>} vlan {<vlanid>}

The “no” form of this command restores the default gigabit Ethernet port VLAN ID to that of the network management VLAN ID.

Defaults Gigabit Ethernet Port VLAN ID = Network Management VLAN ID.

Example

```
BASR(config)# interface gigabit-ethernet 1 vlan 15
```

Related Commands configure interface gigabit-ethernet {<port>} egress-tagging [<vlanid>] on page 11-6
show interface stats {fast-ethernet | gig-ethernet} on page 3-26

```
configure interface gigabit-ethernet {<port>} egress-tagging [<vlanid>]
```

Summary Configures the specified gigabit Ethernet port for VLAN tagging of egress traffic.

Required Mode Interface Config

**User-Entered
Parameters** *<port>*

The *<port>* parameter is the index number of the gigabit Ethernet port: 1 or 2.

<vlanid>

A numerical valid VLAN identification number. The range for this field is 1-4094. This field is optional; if no VLAN ID is specified, VLAN tagging is enabled for all VLANs.

Description This command configures the egress tagging rules for a specified gigabit Ethernet port.

If no VLAN ID is specified when the command is run, the egress tagging rule applies to frames on *all* VLANs (any VLAN ID present in the tag).

If an optional VLAN ID “N” is specified when the command is run, the egress tagging rule applies only to frames for that particular VLAN (VLAN ID = N in the tag).

If egress tagging is enabled, egress traffic is transmitted from the port as tagged frames for VLAN-aware switch operation. The VLAN tag can either have been:

- Already in place when an ingress packet was received (prior to forwarding and egress decisions). In this case, the original VLAN ID within the tag is saved upon egress from the gigabit Ethernet port.
- Inserted by the ingress port prior to forwarding and egress decisions, in which case the packet maintains its ingress port VLAN ID (PVID) upon egress from the gigabit Ethernet port. An ingress port inserts its PVID if a frame is received with no tag (that is, from a non-VLAN aware device), or with a VLAN tag that has a VLAN ID = 0 (a frame carrying an 802.1p priority tag but no explicit VLAN information).

If tagging is disabled, all packets are transmitted as untagged frames for non-VLAN aware operation as described in the “no” form of the command.

You can determine the current status of tagging on the gigabit Ethernet interfaces by using the “show interface stats {fast-ethernet | gig-ethernet}” command.

“no” Form no configure interface gigabit-ethernet {<port>} egress-tagging {<vlanid>}

The “no” form of this command disables VLAN tagging for the specified gigabit Ethernet interface and optional VLAN ID. This is the default state.

In this case, all packets are transmitted from the gigabit Ethernet port as untagged frames for non-VLAN aware operation. Any packet that had previously been VLAN tagged is stripped of that tag upon egress.

Defaults Tagging disabled

Example

```
BASR(config)# interface gigabit-ethernet 1 egress-tagging
```

Related Commands show interface stats {fast-ethernet | gig-ethernet} on page 3-26

ADSL Service Domain VLAN Commands

Use the following commands to enable or disable a service domain, configure the ATM VCs of a service domain, assign a previously configured VLAN to a specific ADSL port as the Port VLAN identifier, configure VLAN tagging on the ADSL port/service domain, and identify the ADSL port/service domain as participating in additional VLANs.

You can also use “show” commands to display VLAN configuration with respect to an ADSL port and service domain.

```
configure service-domain {<1-6>} enable
```

Summary Enables a previously disabled service domain.

Required Mode Global Config

11.3

VLAN and
Service Domain
Configuration
Commands**User Entered
Parameters** **<1-6>**

The specific service-domain to be enabled.

Description

This command enables a previously disabled service domain, and restores the default VPI/VCI value for the ATM PVC connection between the BAS and multiple downstream CPEs on the specified service domain.

“no” form

no configure service-domain {<1-6>}

The “no” form of this command disables this service domain across all ports by setting a VPI-VCI value of 0-0 for that domain.



CAUTION: There is no check to determine whether there is any active communication on that service domain before it is disabled.

Defaults

All service domains enabled

Example

```
BASR(config)# service domain 6 enable
```

Related Commands

configure interface adsl {<port>} service-domain {<1-6>} vpi-vci {<vpi>-<vci>} on page 11-9
show service-domains {<port>} on page 11-18
show interface stats atm {<port>} on page 11-18

```
configure vpi-vci {<port-range> <domain-range> <vpi>-<vci>}
```

Summary

Configures the VPI/VCI value for ATM connections over the ADSL links of a range of ports and service domains.

Required Mode

Global Config

**User Entered
Parameters****<port-range>**

The range of ports for which you want to set VPI-VCI values on one or more service domains. The start and end port can be any port index from 1–48 (depending on the BAS variant). Note that the start value and end value must be separated by a hyphen (for example, 1-5). Note also that the range can also specify a single port (for example, 3-3); however, both a start and end value must be entered for the range.

<domain-range>

The selected service domain range (for the above port range) for which to set VPI-VCI values, where the start and end of the range is a service domain index from 1–6. The start and end value must be separated by a hyphen (for example, 1-4). Note that the range can specify a single service domain for each port (for example 1-1).

- If the VPI-VCI is going to have a non-zero value for either element (that is, VPI = 0 or VCI = 0), the range must specify a single service domain (for example, 6-6).
- If the value of VPI-VCI is going to be 0-0, any service domain range can be used ([1-6]-[1-6]).



NOTE: Setting a VPI-VCI value of 0-0 effectively disables the service domain.

<vpi>

The Virtual Path Identifier of the ATM connection on the service domain. The BAS supports a VPI range of 0 to 100.

<vci>

The Virtual Channel Identifier of the ATM connection on the service domain. The BAS supports a VCI range of 0 to 100.

Description This command configures the VPI/VCI value for the ATM PVC connection between the BAS and multiple downstream CPEs on the specified service domain(s). The subscriber-side VPI/VCI value set at the downstream CPEs (for example, the Pannaway PBG-ADSL or RGN) must match that set at the BAS for each service domain supported by the CPE.



CAUTION: The specified VPI/VCI must match that set at the downstream CPE, otherwise communications across the ADSL link will fail.

“no” form no vpi-vci {<port-range> <domain-range>}
The “no” form of this command restores the default VPI/VCI values to the specified service domains on the specified port range.

Defaults Service Domain 1: VPI = 0; VCI = 37
Service Domain 2: VPI = 0; VCI = 36
Service Domain 3: VPI = 0; VCI = 35
Service Domain 4: VPI = 0; VCI = 38
Service Domain 5: VPI = 0; VCI = 39
Service Domain 6: VPI = 0; VCI = 40

Example

```
BASR(config)# vpi-vci 30-32 6-6 11-11
BASR(config)# vpi-vci 33-48 4-6 0-0
```

Related Commands configure interface adsl {<port>} service-domain {<1-6>} vpi-vci {<vpi>-<vci>} on page 11-9
show service-domains {<port>} on page 11-18
show interface stats atm {<port>} on page 11-18

configure interface adsl {<port>} service-domain {<1-6>} vpi-vci {<vpi>-<vci>}

Summary For a single ADSL port, configures the VPI/VCI value for an ATM connection over the ADSL link on one of six available service domains.

Required Mode Interface Config

User Entered Parameters <1-6>

The selected service domain (virtual channel), indexed 1–6.

11.3

VLAN and Service Domain Configuration Commands

11.3

VLAN and Service Domain Configuration Commands

<vpi>

The Virtual Path Identifier of the ATM connection on the service domain. The BAS supports a VPI range of 0 to 100.

<vci>

The Virtual Channel Identifier of the ATM connection on the service domain. The BAS supports a VCI range of 0 to 100.

Description This command configures the VPI/VCI value for the ATM PVC connection between the BAS and the downstream CPE on the specified service domain. The subscriber-side VPI/VCI value set at the downstream CPE (for example, the Pannaway PBG-ADSL or RGN) must match that set at the BAS for each service domain supported by the CPE.



CAUTION: The specified VPI/VCI must match that set at the downstream CPE, otherwise communications across the ADSL link will fail.

“no” form no service-domain {<1-6>} vpi-vci
The “no” form of this command restores the default VPI/VCI to the specified service domain.

Defaults Service Domain 1: VPI = 0; VCI = 37
Service Domain 2: VPI = 0; VCI = 36
Service Domain 3: VPI = 0; VCI = 35
Service Domain 4: VPI = 0; VCI = 38
Service Domain 5: VPI = 0; VCI = 39
Service Domain 6: VPI = 0; VCI = 40

Example

```
BASR(config-if)# service-domain 1 vpi-vci 0-50
```

Related Commands show service-domains {<port>} on page 11-18
show interface stats atm {<port>} on page 11-18

configure interface adsl {<port>} service domain {<1-6>} vlan {<vlanid>}

Summary Assigns a VLAN as the Port VLAN Identifier (PVID) for the specified ADSL port and service domain (logical sub-interface).

Required Mode Interface Config

User-Entered **<port>**

Parameters The <port> parameter is the index number of the ADSL port (1-48, depending on BAS model).

<1-6>

The index number of the service domain for which you want a PVID assignment.

<vlanid>

The identifier of a previously created VLAN that you want to assign to the ADSL port service domain as its PVID.

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VLAN and
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Description This command assigns a Port VLAN Identifier to the specified ADSL port and service domain. The PVID is used for the purposes of VLAN tagging when a packet is received on that port and service domain (logical sub-interface). If tagging is enabled on the ADSL port, the port tags any untagged or priority (VLAN tag 0) tagged packet with its PVID.

“no” Form no configure adsl {<port>} service domain {<1-6>} vlan {<vlanid>}
The “no” form of this command configures tagging behavior for the specified ADSL interface to disabled (the default condition). In this case, all packets are transmitted as untagged frames for non-VLAN operation.

Defaults The following VLANs are assigned by default to each service domain as their PVID.

- service domain 1 – 4060
- service domain 2 – 4061
- service domain 3 – 4062 (the default Management VLAN ID)
- service domain 4 – 4063
- service domain 5 – 4064
- service domain 6 – 4065

Example

```
BASR(config)# interface adsl 4 service domain 2 vlan 70
```

Related Commands configure vlan {<vlanid>} on page 11-4
show service-domains {<port>} on page 11-18
show interface stats atm {<port>} on page 11-18

configure interface adsl {<port>} service domain {<1-6>} egress-tagging

Summary Configures the specified ADSL port and service-domain for VLAN tagging of egress traffic.

Required Mode Interface Config

User-Entered**Parameters**

<port>
The <port> parameter is the index number of the ADSL port (1-48, depending on BAS model).

<1-6>

The index number of the service domain for which you want to enable VLAN tagging.

Description This command configures the tagging behavior for the specified ADSL port and service domain to enabled. If tagging is enabled, traffic is transmitted from the ADSL logical sub-interface (service domain) as tagged frames for VLAN-aware switch operation.

- If a packet received on the ADSL port/service domain already has a tag, it is forwarded with the existing tag in place.
- If a packet is received on the ADSL port/service domain with no tag or marked as “priority” frame (with a VLAN tag of 0), the packet is tagged with the ADSL port/service domain’s PVID before being forwarded.

11.3

VLAN and
Service Domain
Configuration
Commands**“no” Form** no configure adsl {<port>} service domain {<1-6>} egress-tagging

The “no” form of this command configures tagging behavior for the specified ADSL port/service domain to disabled (the default condition). In this case, all packets are transmitted as untagged frames for non-VLAN operation.

- If a packet received on the ADSL port/service domain already has a tag, the tag is stripped off before it is forwarded.
- If a packet is received on the ADSL port/service domain with no tag or marked as “priority” frame, the packet is forwarded as is with no VLAN tag in place.

Defaults Tagging disabled

Example

```
BASR(config)# interface adsl 16 service-domain 3 egress-tagging
```

Related Commands show service-domains {<port>} on page 11-18
show interface stats atm {<port>} on page 11-18

configure interface adsl {<port>} service domain {<1-6>} rate-limit {<bps>}

Summary Configures the maximum transmit rate over the specified ADSL port and service domain.

Required Mode Interface Config

User-Entered <port>

Parameters The <port> parameter is the index number of the ADSL port (1-48, depending on BAS model).

<1-6>

The index number of the service domain for which you want to set the maximum transmit rate.

<bps>

The maximum transmission rate on the ADSL port and service domain, in bits per second. The range is 128000 (128 Kbps) to 25,000,000 (25 Mbps).

Description This command configures a maximum transmit rate for the specified ADSL port and service domain. If a rate limit is configured, traffic transmitted on the ADSL logical sub-interface (service domain) is capped at a certain transmission speed (for example 128000 for a 128 Kbps data connection).

“no” Form no configure adsl {<port>} service domain {<1-6>} rate-limit

The “no” form of the command restores the default setting of no rate-limiting on the port and service domain.

Defaults No rate limit configured.

Example

```
BASR(config)# interface adsl 16 service-domain 3 egress-tagging
```

Related Commands show service-domains {<port>} on page 11-18
show interface stats atm {<port>} on page 11-18

```
configure interface adsl {<port>} service-domain {<1-6>} vlan-participation {<vlanid>}
```

Summary Configures the specified ADSL port and service domain as being a member of a given VLAN, as specified by VLAN ID.

Required Mode Interface Config

User Entered Parameters **<service-domain>**

The selected virtual channel (or logical sub-interface), indexed 1–6.

<vlanid>

The VLAN Identifier of the VLAN in which the ADSL port and logical sub interface should participate.

Description This command configures the specified ADSL port and service domain as participating in a given VLAN. Frames with a VLAN tag matching the VLAN ID specified will be forwarded across the ADSL link.

no service-domain {<1-6>} vlan-participation {<vlanid>}

The “no” form removes the association between the ADSL port and service domain with the specified VLAN.

Defaults None

Example

```
BASR# configure interface adsl 5 service-domain 2 vlan-participation 80
```

Related Commands show service-domains {<port>} on page 11-18
show interface stats atm {<port>} on page 11-18

11.4

Special VLAN Configuration Commands

11.4 Special VLAN Configuration Commands

The following sections describe the specialized MAC Forced Forwarding, Secure Forced Forwarding, and Q-in-Q VLANs. The EAPS VLAN is described in *Chapter 14, “Ethernet Automatic Protection Switching”*.

MAC Forced Forwarding VLAN Commands

MAC Forced Forwarding is a method of ensuring layer 2 (MAC-layer) separation of subscriber traffic that is transmitted over the Ethernet bridge of the BAS. This is achieved by forcing the endpoints connected to the BAS to resolve IP-to-MAC layer address requests (ARPs) by proxying all ARP requests to the MAC address of the designated Access Router.

MAC Forced Forwarding takes place as follows:

- The BAS is provisioned with a MAC Forced Forwarding VLAN that is associated with the IP and MAC address of a designated Access Router. Multiple VLANs and associated Access Routers can be provisioned.
- After an endpoint is assigned to a MAC Forced Forwarding VLAN, the BAS responds to any ARP request from that endpoint with the destination MAC address of the designated Access Router.
- The BAS discards any upstream Unicast traffic that is sent to a MAC address other than that of the designated Access Router. IGMP group reports are still forwarded.

The following command is used to specify that an existing VLAN be used as a MAC Forced Forwarding VLAN.

11.4

Special VLAN Configuration Commands

```
configure vlan {<vlanid>} mac-forced-forward primary {<AR_mac_addr>} {<AR_ip_addr>}
```

Summary Create a new MAC Forced Forwarding VLAN.

Required Mode Privileged Exec, Global Config

User-Entered *<vlanid>*

Parameters A numerical valid VLAN identification number. The range for this field is 1-4094, excluding the default VLAN IDs of 4060-4065.

<AR_mac_addr>

The MAC address of the access router.

<AR_ip_addr>

The IP address of the access router.

Description This command creates a new MAC Forced Forwarding VLAN in the BAS VLAN database and assigns it an ID. This VLAN forwards all unicast traffic to the destination MAC address of the access router, and discards unicast traffic with any other destination MAC address.

“no” Form no configure vlan {<vlanid>} mac-forced-forward {<AR_mac_addr>}

The “no” form of the command deletes an existing MAC Forced Forwarding VLAN, as specified by its <vlanid>.



NOTE: A MAC Forced Forwarding VLAN cannot be deleted if it is assigned to an ADSL port's service domain as either a port VLAN (PVID) or participating VLAN. You must remove the VLAN assignment from all ports before being able to successfully delete the VLAN.

Defaults Not configured.

Example

```
BASR# configure vlan 373 mac-forced-forward primary ab:12:cd:34:ef:56 172.5.2.3
```

Related Commands show service-domains {<port>} on page 11-18
configure interface adsl {<port>} service domain {<1-6>} vlan {<vlanid>} on page 11-10

Secure Forced Forwarding VLAN Commands

Secure Forced Forwarding is similar to MAC Forced Forwarding, with one significant difference: the BAS discards *any* ARP request unless it is for the IP address of the Access Router. This means that the BAS *only* forwards packets destined for the access router, and discards packets destined for any other IP address.

The following command is used to specify that an existing VLAN be used as a Secure Forced Forwarding VLAN.


```
configure vlan {<vlanid>} secure-forced-forward {<AR_mac_addr>} {<AR_ip_addr>}
```

Summary Create a new Secure Forced Forwarding VLAN.

Required Mode Privileged Exec, Global Config

User-Entered Parameters **<vlanid>**
A numerical valid VLAN identification number. The range for this field is 1-4094, excluding the default VLAN IDs of 4060-4065.

<AR_mac_addr>
The MAC address of the access router.

<AR_ip_addr>
The IP address of the access router.

Description This command creates a new Secure Forced Forwarding VLAN in the BAS VLAN database and assigns it an ID. The Secure Forced Forwarding VLAN discards any traffic except that with a destination IP of the access router.

"no" Form no configure vlan {<vlanid>} secure-forced-forward {<AR_mac_addr>} {<AR_ip_addr>}
The "no" form of the command deletes an existing Secure Forced Forwarding VLAN, as specified by its <vlanid>.



NOTE: A Secure Forced Forwarding VLAN cannot be deleted if it is assigned to an ADSL port's service domain as either a port VLAN (PVID) or participating VLAN. You must remove the VLAN assignment from all ports before being able to successfully delete the VLAN.

Defaults Not configured.

Example

```
BASR(config)# vlan 373 secure-forced-forward ab:12:15:34:ef:8a 172.5.11.14
```

Related Commands show service-domains {<port>} on page 11-18
configure interface adsl {<port>} service domain {<1-6>} vlan {<vlanid>} on page 11-10

Q-in-Q VLAN Commands

The command in this section is used to configure a double VLAN tunnel (also known as "VLAN stacking" or "Q-in-Q VLANs"), which allows a service provider to use a single VLAN to service customers that use multiple VLANs on their own subscriber network. This is accomplished by encapsulating a subscriber's IEEE 802.1Q VLAN tag, known as the C-TAG (customer tag) within the higher-level service provider 802.1Q VLAN tag, known as the S-TAG (service tag) or P-TAG (provider tag).

The BAS implementation of Q-in-Q VLANs allows for the provider tag portion of the double VLAN tunnel to be specified; it does not allow you to specify the customer-side VLAN tag. This means that the subscriber must have premises equipment that is capable of tagging traffic with their own subscriber VLAN tag, and the terminating subscriber-side equipment must be able to interpret the tagged traffic appropriately (after the provider VLAN tag has been stripped off).

11.4

Special VLAN Configuration Commands

11.4

Special VLAN Configuration Commands



CAUTION: Some of Pannaway's ADSL CPE equipment does not currently support 802.1Q VLAN tagging (including tagged traffic that is transmitted through the subscriber-side Ethernet ports).

Q-in-Q VLAN traffic is transparent as far as the BAS (and upstream routers) are concerned. Data carried in the Q-in-Q VLAN is not subject to any filtering or snooping rules as it traverses the BAS gigabit Ethernet ports.

When you configure a Q-in-Q VLAN, you must provision the VLAN with the same VLAN ID throughout the provider network (to identify the provider-side S-TAG). You must also ensure that the subscriber's uplink PVC is provisioned with a VPI/VCI value that matches the one set for the BAS service domain on which the Q-in-Q VLAN is to be applied.



CAUTION: For release version 2.2 of the Pannaway BAS, 0x8100 hex (33024 decimal) is the only EtherType value supported. You must ensure that if the VLAN is traversing devices other than a BAS, a matching EtherType value is set on those devices for the Q-in-Q VLAN.

Other common EtherType values that may be used by default on other vendors' equipment includes 0x88A8 hex (34984 decimal – the standard 802.1ad S-TAG Service VLAN Tag identifier), 0x9100 hex (37120 decimal), and 0x9200 hex (37376 decimal).

configure vlan {<vlanid>} q-in-q

Summary Configures the provider tag for a Double VLAN tunnel.

Required Mode Global Config

User-Entered Parameters <vlanid>

A numerical valid VLAN identification number for the provider tag. The range for this field is 1-4094, excluding the default VLAN IDs of 4060-4065.

Description This command configures the provider's VLAN identification for the Double VLAN tunnel on the specified interface. Any subscriber-side VLAN-tagged traffic is encapsulated in this

"no" Form no configure vlan {<vlanid>} q-in-q
The "no" form of the command deletes the assigned provider tag for a Double VLAN tunnel.



NOTE: A Q-in-Q VLAN cannot be deleted if it is assigned to an ADSL port's service domain as the port VLAN (PVID). You must remove the VLAN assignment from all ports before being able to successfully delete the VLAN.

Defaults None

Example

```
BASR(config)# vlan 314 q-in-q
```

Related Commands show service-domains {<port>} on page 11-18
configure interface adsl {<port>} service domain {<1-6>} vlan {<vlanid>} on page 11-10

11.5 VLAN and Service Domain Show Commands

The following commands display information about VLAN and service domain configuration.

```
show vlan [<vlanid>]
```

Summary Displays VLAN-related settings.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered *<vlanid>*

Parameters A numerical valid VLAN identification number for a specific VLAN of interest. The range for this field is 1-4094.

If the command is entered without this parameter, settings information is displayed for all VLANs.

Description This command displays VLAN configuration for a given VLAN, or for all VLANs if no VLAN ID is specified.

Example

```
BASR# show vlan 30
```

```
VLAN ID: 30
VLAN Name: Management
VLAN Type: Management
```

```
Number of ADSL ports: 4
ADSL ports included: 09 10 17 26
ADSL ports excluded: 01 02 03 04 05 06 07 08
                    11 12 13 14 15 16 18 19
                    20 21 22 23 24 25 27 28
                    29 30 31 32
```

```
Joins Rec'd:      302620  Leaves Rec'd:      11188  Queries Rec'd:      5692
Queries Sent:     172619  v3 Reports Rec'd:      0  Groups Aged:      11160
```

Command Output The following information is shown for each VLAN in the output:

VLAN ID	The VLAN Identifier (VLAN ID) associated with the VLAN.
VLAN Name	Indicates the assigned VLAN name (if configured).
VLAN Type	Indicates the VLAN Type, identifying whether the VLAN is a standard VLAN or a special-purpose VLAN. Possible VLAN Types are Standard, Management, Voice, EAPS, MAC Forced Forward, Secure Force Forward, or Q-in-Q.
Number of ADSL ports	The number of ADSL ports that have membership in the VLAN.
ADSL ports included	The interface index numbers of all ADSL ports that participate in the VLAN, through either a fixed registration or a dynamic registration.
ADSL ports excluded	The interface index numbers of all ADSL ports that are not members of the VLAN.

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IGMP Statistics	Statistical information for any dynamic multicast group participating in the VLAN through dynamic registration (via IGMP). See “show igmp” on page 9-4.
-----------------	---

11.5

VLAN and Service Domain Show Commands

Related Commands

- configure vlan {<vlanid>} on page 11-4
- configure vlan {<vlanid>} name {<text_string>} on page 11-5
- configure network mgmt_vlan {<vlanid>} on page 11-3
- configure vlan {<vlanid>} mac-forced-forward primary {<AR_mac_addr>} {<AR_ip_addr>} on page 11-14
- configure vlan {<vlanid>} secure-forced-forward {<AR_mac_addr>} {<AR_ip_addr>} on page 11-15
- network voice_vlan {<vlanid>} on page 7-7
- configure vlan {<vlanid>} eaps on page 14-6
- show igmp on page 9-4

```
show service-domains {<port>}
```

```
show interface stats atm {<port>}
```

Summary Displays service domain settings and statistics for a selected port. This includes interface statistics, operational status (including the VPI/VCI and VLAN settings), and VLAN configuration for the ATM interface associated with an ADSL port.



NOTE: These two commands produced virtually identical output. The “show service-domains <port>” command was added to provide a more logical command line syntax for accessing service domain configuration information.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters **<port>**
The index number of the ADSL port of interest (1-48, depending on the BAS variant).

Description This command displays Service Domain configuration and statistics for the six service domains associated with a given port.

Example

```
10.11.2.5# show service-domains 3
```

```
Port 3, Service Domain 1:
```

```
PVID                : 4060
Egress Tagging       : Disabled
Rate Limit bps       : 25000000
IP MTU               : 1522
Shared BW bps        : 25000000
Admin state          : Up
Oper state           : Down
in unicast packets   : 0
in broadcast packets : 0
in multicast packets : 0
out unicast packets  : 0
out broadcast packets : 0
out multicast packets : 0
interface vpi        : 0
interface vci        : 37
```

```
-----
REMAINDER OF OUTPUT (SERVICE DOMAINS 2-6) CUT FOR EXAMPLE PURPOSES
```

Example

```
BASR(config)# show interface stats atm 5
```

```
Service Domain 1:
```

```
PVID                : 4060
Egress Tagging       : Disabled
Rate Limit bps       : 25000000
IP MTU               : 1522
Shared BW bps        : 25000000
Admin state          : Up
Oper state           : Down
in unicast packets   : 0
in broadcast packets : 0
in multicast packets : 0
out unicast packets  : 0
out broadcast packets : 0
out multicast packets : 0
interface vpi        : 0
interface vci        : 37
interface include vlan: 211
```

```
-----
REMAINDER OF OUTPUT (SERVICE DOMAINS 2-6) CUT FOR EXAMPLE PURPOSES
```

Command Output The following information is shown for each service domain in the output.



NOTE: The statistical output of this command is not described below. This information is provided in Chapter 6, under a command description of this same command. See `show interface stats atm {<port>}` on page 6-93.

Service Domain Index	The index of each per port service domain (1-6).
PVID	The port VLAN Identifier assigned to the ADSL port and service domain.

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Service Domain
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Commands*

11.5

VLAN and
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Commands

Egress Tagging	Indicates whether egress tagging is enabled or disabled on the ADSL port and service domain.
Rate limit bps	Displays any rate limit assignment for the ADSL port and service domain; if no rate limit is in effect, the maximum value of 25,000,000 is displayed.
interface vpi	The Transmit/Receive Virtual Path Identifier (VPI) used by the interface.
interface vci	The Transmit/Receive Virtual Channel Identifier (VCI) used by the interface.
interface include VLAN	Displays the VLAN Identifier of any VLANs to which this ADSL interface and service domain have been added.

Related Commands configure interface adsl {<port>} service-domain {<1-6>} vpi-vci {<vpi>-<vci>} on page 11-9
 configure interface adsl {<port>} service-domain {<1-6>} vlan {<vlanid>} on page 11-10
 configure interface adsl {<port>} service-domain {<1-6>} egress-tagging on page 11-11
 configure interface adsl {<port>} service-domain {<1-6>} rate-limit {<bps>} on page 11-12
 configure interface adsl {<port>} service-domain {<1-6>} vlan-participation {<vlanid>} on page 11-13
 clear stats adsl {<port-range> <service-domain-range>} on page 11-20

```
clear stats adsl {<port-range> <service-domain-range>}
```

Summary Resets the statistics for the ATM interface associated with one or more ADSL ports.

Required Mode Privileged Exec

User Entered Parameters <port-range>

The range of ADSL ports for which to clear statistics. To specify an individual port, use the desired port index as the start and end of the range (for example, 3-3).

<service-domain-range>

The selected virtual channel range from N-N, where the value of N is an integer from 1-6. To specify a single service domain, use the desired index as both the start and end of the range (for example, 2-2).

Description Resets ADSL port ATM statistics counters to zero. These statistics can be displayed via the “show interface stats atm” command.

“no” form None

Defaults None

Example

```
BASR# clear stats adsl 13
```

Related Commands show interface stats atm {<port>} on page 11-18
 show interface stats atm {<port>} on page 11-18
 show service-domains {<port>} on page 11-18

Chapter 12

Filtering Traffic

12.1 Contents of this Chapter

This chapter describes the commands that configure global filters and port filtering rules on the Pannaway BAS. The following sections are presented in this chapter:

Topic	on page
About Traffic Filters and Rules	12-1
Filtering Creation Commands	12-2
Filtering Display Commands	12-9

12.2 About Traffic Filters and Rules

This chapter describes the commands used to configure filtering rules on the BAS, and apply them to individual interfaces. Filtering rules allow or deny passage of inbound or outbound packets through the Broadband Access Switch based on criteria specified during filter creation. They can also be used to prioritize packet transmission.

Filters are created at a global (device-wide) level, and then filtering rules are applied on a port-by-port basis with specific criteria-matching values.

The global criteria for a filter can be based on the source or destination address (physical or logical IP), layer-2 or layer-3 protocol, layer-4 source or destination TCP/UDP port, TOS (type of service) bit, or VLAN ID or priority setting.

A global filter can contain multiple criteria. If so, these multiple criteria are ANDed when an incoming packet is compared to a filtering rule. An incoming packet must meet *all* criteria in the filter for the rule to be applied. For example, if you construct a filter that includes both a source IP address parameter and a VLAN ID, an incoming packet must have the specified source IP address AND the specified VLAN ID to match the filtering rule.

Once a global filter is created, you configure filtering rules on a port-by-port basis. A port can be configured to block any packet that matches the filtering rules, or – if it is an ADSL port – to transmit the packet on a selected priority queue. At the port level, you define the actual criteria values that must be met for the filtering rule to take effect. For example, with a global filter with criteria of source IP address and VLAN ID, you could configure a filtering rule on ADSL port 3, using a source IP address of 172.16.4.92 and a VLAN ID of 3041.

You can create 12 global filters, and configure up to 10 filtering rules per ADSL or Gigabit Ethernet interface (up to a total of 1000 filtering rules).

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Filtering Creation Commands

Filtering rules are applied in the order that they are created on a port. In the case of a “block” traffic rule, this has no bearing on how the port treats packets. If a packet matches any “block” rule, it is dropped. However, you may need to plan how to apply filtering rules for ADSL priority queue prioritization. If a packet matches multiple filtering rules, the first (earliest) rule created takes effect before the packet can be matched against any further filtering rules – so the packet is transmitted on the priority queue associated with the first rule, and no further priority queuing is applied.

12.3 Filtering Creation Commands

The following commands are used to create a global filter, and define a filtering rule on a particular port.

Configuring a Global Filter

Use the following command to configure a global filter.

```
filter {<1-12>} {ingress | egress} {dst-ip | dst-mac | l2-protocol | l3-protocol | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority}
```

Summary Create a new global filter.

Required Mode Global Config

User-Entered <1-12>

Parameters The index number of the global filter being created. The range is from 1-12.

{ingress | egress}

This parameter identifies the direction in which filtering is applied.

- If you specify ingress, filtering is applied on traffic inbound to the port.
- If you specify egress, filtering is applied on traffic outbound from the port.

{dst-ip | dst-mac | l2-protocol | l3-protocol | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority}

This parameter indicates which criteria is used for the filter.

- **dst-ip** – A filtering rule is applied based upon a defined destination IP address.
- **dst-mac** – A filtering rule is applied based upon a defined destination MAC-layer (physical) address.
- **l2-protocol** – A filtering rule is applied based upon a selected ISO layer 2 protocol: ARP (Address Resolution Protocol), PPP (Point-to-Point Protocol), or IP (Internet Protocol).
- **l3-protocol** – A filtering rule is applied based upon a selected ISO layer 3 protocol: ICMP (Internet Control Management Protocol), TCP (Transmission Control Protocol), UDP (User Datagram Protocol), OSPF (Open Shortest Path First routing protocol), IGRP (Interior Gateway Routing Protocol), IGRE (), IGP (Interior Gateway Protocol), GRE (Generic Routing Encapsulation protocol – often used for VPN), or EIGRP (Cisco’s Enhanced Interior Gateway Routing Protocol).
- **l4-dst-port** – A filtering rule is applied based upon a defined layer 4 TCP/UDP destination port number.
- **l4-src-port** – A filtering rule is applied based upon a defined layer 4 TCP/UDP source port number.
- **src-ip** – A filtering rule is applied based upon a defined source IP address.

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- **src-mac** – A filtering rule is applied based upon a defined source MAC-layer (physical) address.
- **tos** – A filtering rule is applied based upon the IP header's Type of Service bit (or DiffServ) setting.
- **vlan-id** – A filtering rule is applied based upon a given VLAN ID.
- **vlan-priority** – A filtering rule is applied based upon a given VLAN priority.

Description This command creates a new global filter on the BAS. This filter allows you to construct the rules that allow or deny inbound and outbound traffic to pass through a BAS port. If you are using multiple filtering criteria in a rule, you must perform the command two (or more times) using the same global filter index number, with a different criterion used for each command entry. The example on the next page creates an ingress filter (index 1) that uses both destination IP address and TOS bit as the filtering criteria.



NOTE: You cannot modify a global filter that is being used for active filter rules (as described in the next section). You must disable any active filter rules before modifying a global filter associated with those rules. Attempting to do so results in an error message.

“no” Form no filter {<1-12>} {ingress | egress} {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority}
The “no” form of this command deletes the specified filter criteria. If you have multiple criteria defined for a filter, each criterion must be deleted individually to clear the filter entirely (as shown in the “no filter” command entries in the example below).

Defaults None

Example

```
BAS(config)# filter 1 ingress dst-ip
BAS(config)# filter 1 ingress tos
BAS(config)# no filter 2 egress src-ip
BAS(config)# no filter 2 egress vlan-id
```

Related Commands show filters on page 12-9

**Configuring a
Filtering Rule on
Ports**

Use the following commands to configure a filtering rules on the BAS gigabit Ethernet ports or ADSL ports (at the service domain level).

```
gigabit-ethernet {<1-2>} filter-rule {<1-10> <1-12>} blocking {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>}
```

Summary Create a filtering rule on a gigabit Ethernet port to block inbound or outbound traffic.

Required Mode Interface Config

User-Entered Parameters <1-2>
The gigabit Ethernet port index (1 or 2).

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<1-10>

The per port index to assign to the filtering rule. Each port supports up to 10 filtering rules.

<1-12>

The global filter index to be used for the rule. This must correspond to a previously configured filter, or else an error is returned.

{*dst-ip* / *dst-mac* / *i2-proto* / *i3-proto* / *i4-dst-port* / *i4-src-port* / *src-ip* / *src-mac* / *tos* / *vlan-id* / *vlan-priority*}

The criteria defined in the global filter index for which you are entering a filter-matching value. Criteria and value formats are:

- **dst-ip** – Destination IP address. The rule value for this criteria must be entered in dotted decimal notation (NNN.NNN.NNN.NNN).
- **dst-mac** – Destination MAC-layer (physical) address. The rule accepts a value entered in colon-separated six-byte hexadecimal format (XX:XX:XX:XX:XX:XX, where X ranges from 0-9, or A-F).
- **i2-proto** – The selected ISO layer 2 protocol: <arp | ppp | ip >.
- **i3-proto** – The selected ISO layer 3 protocol: <icmp | tcp | udp | ospf | igmp | igre | igp | grp | gre | eigrp>.
- **i4-dst-port** – Layer 4 TCP/UDP destination port number. The rule accepts an integer value in the range of 0-65535. Well-known port numbers are defined by the IANA (Internet Assigned Numbers Authority), and can be viewed at <http://www.iana.org/assignments/port-numbers>.
- **i4-src-port** – Layer 4 TCP/UDP source port number. The rule accepts an integer value in the range of 0-65535.
- **src-ip** – A filtering rule is applied based upon a defined source IP address. The rule value for this criteria must be entered in dotted decimal notation (NNN.NNN.NNN.NNN).
- **src-mac** – Source MAC-layer (physical) address. The rule accepts a value entered in colon-separated six-byte hexadecimal format (XX:XX:XX:XX:XX:XX, where X ranges from 0-9, or A-F).
- **tos** – A filtering rule is applied based upon the IP header's Type of Service (TOS)/Differentiated Services (DiffServ) bit setting. The rule accepts an integer value in the range of 0-255. This decimal value maps to the first six bits of the eight-bit TOS/DSCP setting (these are the significant bits; the last two bits are currently unused and fixed at "00"). For example, enter "46" for an Expedited Forwarding per-hop behavior (an octal value of 101110). This filter should only be used in a network that deploys end-to-end QoS.
- **vlan-id** – A given VLAN ID. The rule accepts an integer value in the range of 0-4095.
- **vlan-priority** – A filtering rule is applied based upon a given VLAN priority.

Description This command configures a filtering rule on a BAS gigabit Ethernet port. Once a filtering rule is configured and enabled, packets that match the filter are blocked from passing through the specified port (in an inbound or outbound direction, as defined in the global filter).

If a filtering rule is based on a global filter with multiple criteria, you must perform the command two or more times (using the same global filter index number and port filtering rule index) to enter a value for each criterion defined in the global filter. The Example below creates a filtering rule (with port filtering rule index 3 and global filter index 1) that provides values for the VLAN ID and VLAN priority criteria of the global filter.

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“no” Form no filter-rule {<1-10> <1-12>} blocking {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>}
The “no” form of this command deletes the specified filter criteria. If you have multiple criteria defined for a filter, each criterion must be deleted individually.



NOTE: A filter rule must be inactive to be modified by deleting or changing its values. If a filter rule is enabled (as described in the next command), you must first disable the filter rule by using the “no” form of the enable command. If you do not, you receive an error message.

Defaults None

Example

```
BAS(config)# interface gigabit-ethernet 1 filter-rule 3 1 blocking vlan-id 3000
BAS(config)# interface gigabit-ethernet 1 filter-rule 3 1 blocking vlan-priority 6
```

Related Commands gigabit-ethernet {<1-2>} filter-rule {<1-10> <1-12>} blocking enable on page 12-5
show interface gigabit-ethernet {<1- 2>} filter-rules on page 12-10

gigabit-ethernet {<1-2>} filter-rule {<1-10> <1-12>} blocking enable

Summary Enables a valid filter rule on a gigabit Ethernet port.

Required Mode Interface Config

User-Entered Parameters **<1-2>**
The gigabit Ethernet port index (1 or 2).

<1-10>
The per port index of the filtering rule to be enabled.

<1-12>
The global filter index that was used to define the filtering rule.

Description This command enables a fully configured filtering rule on the gigabit Ethernet port.



NOTE: A value must be provided for each criteria in the global filter before the filter can be successfully enabled. Note that the “enable” key word can be used at the same time as the last filtering criteria is defined (that is, in the Example on the previous page, the last filter rule entry could be: interface gigabit-ethernet 1 filter-rule 1 1 blocking vlan-priority 6 enable).

“no” Form no filter-rule {<1-10> <1-12>} blocking enable
The “no” form of this command disables the filter rule so that it can be modified or left un-configured.



NOTE: A filter rule must be inactive to be modified by deleting or changing its values. If a filter rule is enabled (as described in the next command), you must first disable the filter rule by using the “no” form of the enable command. If you do not, you receive an error message.

Defaults None**Example**

```
BAS(config)# interface gigabit-ethernet 1 filter-rule 1 1 blocking enable
```

Related Commands gigabit-ethernet {<1-2>} filter-rule {<1-10> <1-12>} blocking {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>} on page 12-3
show interface gigabit-ethernet {<1- 2>} filter-rules on page 12-10

```
adsl {<1-48>} service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>}
```

Summary Create a filtering rule on an ADSL port and service domain to block or prioritize inbound or outbound traffic (data packets only).

Required Mode Interface Config

User-Entered Parameters **<1-48>**

The ADSL port index (up to 32 or 48 ports, depending on BAS model).

<1-6>

The selected service domain (virtual channel), indexed 1–6, as described in “Service Domains” on page 11-1.

<1- 10>

The per port index to assign to the filtering rule. Each port supports up to 10 filtering rules.

<1- 12>

The global filter index to be used for the rule. This must correspond to a previously configured filter, or else an error is returned.

{blocking / priority-high / priority-med / priority-low}

The action to be associated with this filtering rule:

- blocking – Drop data packets that match this filter.
- priority-high – Prioritize data packets that match this filter so that they have the highest priority within the data packet queue, and are transmitted before medium or low priority data packets.
- priority-med – Prioritize data packets that match this filter so that they have a normal priority within the data packet queue, and are transmitted before low priority data packets.
- priority-low – Prioritize data packets that match this filter so that they have a low priority within the data packet queue, and are transmitted after high or medium priority data packets.

12.3

Filtering Creation Commands



CAUTION: Prioritization of packets exists only within the transmission queue for data packets. If a filter-rule is created to give a certain packet type a high priority, that packet is See “Packet Priority” on page 11-2 for more information.

Control (network management) and Voice-over-IP packets have a higher packet priority than data packets, and therefore are queued for transmit before data packets.

In addition, voice packets and IGMP multicast (video) traffic cannot be filtered (blocked or prioritized).

{dst-ip / dst-mac / l2-proto / l3-proto / l4-dst-port / l4-src-port / src-ip / src-mac / tos / vlan-id / vlan-priority}

The criteria defined in the global filter index for which you are entering a filter-matching value. Criteria and value formats are:

- **dst-ip** – Destination IP address. The rule value for this criteria must be entered in dotted decimal notation (NNN.NNN.NNN.NNN).
- **dst-mac** – Destination MAC-layer (physical) address. The rule accepts a value entered in colon-separated six-byte hexadecimal format (XX:XX:XX:XX:XX:XX, where X ranges from 0-9, or A-F).
- **l2-proto** – The selected ISO layer 2 protocol: <arp | ppp | ip >.
- **l3-proto** – The selected ISO layer 3 protocol: <icmp | tcp | udp | ospf | igmp | igre | igp | grp | gre | eigrp>.
- **l4-dst-port** – Layer 4 TCP/UDP destination port number. The rule accepts an integer value in the range of 0-65535. Well-known port numbers are defined by the IANA (Internet Assigned Numbers Authority), and can be viewed at <http://www.iana.org/assignments/port-numbers>.
- **l4-src-port** – Layer 4 TCP/UDP source port number. The rule accepts an integer value in the range of 0-65535.
- **src-ip** – A filtering rule is applied based upon a defined source IP address. The rule value for this criteria must be entered in dotted decimal notation (NNN.NNN.NNN.NNN).
- **src-mac** – Source MAC-layer (physical) address. The rule accepts a value entered in colon-separated six-byte hexadecimal format (XX:XX:XX:XX:XX:XX, where X ranges from 0-9, or A-F).
- **tos** – A filtering rule is applied based upon the IP header’s Type of Service (TOS)/Differentiated Services (DiffServ) bit setting. The rule accepts an integer value in the range of 0-255. This decimal value maps to the first six bits of the eight-bit TOS/DSCP setting (these are the significant bits; the last two bits are currently unused and fixed at “00”). For example, enter “46” for an Expedited Forwarding per-hop behavior (an octal value of 101110). This filter should only be used in a network that deploys end-to-end QoS.
- **vlan-id** – A given VLAN ID. The rule accepts an integer value in the range of 0-4095.
- **vlan-priority** – A filtering rule is applied based upon a given VLAN priority.

Description This command configures a filtering rule on a BAS ADSL port and service domain. Once a filtering rule is configured and enabled, packets that match the filter are either:

- Blocked from passing through the specified port (in an inbound or outbound direction, as defined in the global filter).
- Prioritized within the data packet transmission queue, according to high, medium, or low transmission priority.

12.3

Filtering Creation Commands

12.3

Filtering Creation Commands

If a filtering rule is based on a global filter with multiple criteria, you must perform the command two or more times (using the same global filter index number and port filtering rule index) and enter a value for each criterion defined in the global filter. The example below creates a filtering rule on service domain 3 of ADSL port 42. The filtering rule, with a rule index of 4 and a global filter index of 1, prioritizes traffic for data packets with source and destination TCP/UDP port values used for Xbox gaming.

“no” Form no service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>}
The “no” form of this command deletes the specified filter rule criteria. If you have multiple criteria defined for a filter, each criterion must be deleted individually.



NOTE: A filtering rule must be inactive to be modified by deleting or changing its values. If a filtering rule is enabled (as described in the next command), you must first disable the rule by using the “no” form of the enable command.

Defaults None

Example

```
BAS(config)# interface adsl 42 service-domain 3 filter-rule 4 1 priority-high
l4-dst-port 3074
BAS(config)# interface adsl 42 service-domain 3 filter-rule 4 1 priority-high
l4-src-port 3074
```

Related Commands adsl {<1-48>} service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} enable on page 12-8
show interface adsl {<1-48>} service-domain {<1-6>} filter-rules on page 12-11

adsl {<1-48>} service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} enable

Summary Enables a valid filtering rule on an ADSL port.

Required Mode Interface Config

User-Entered Parameters <1-32/48>

The ADSL port index (1 to 32 or 48, depending on the BAS model).

<1-6>

The selected service domain index (1–6).

<1-10>

The per port index of the filtering rule to be enabled.

<1-12>

The global filter index that was used to define the filtering rule.

Description This command enables a fully configured filtering rule on the ADSL port.



NOTE: A value must be provided for each criteria in the global filter before the filter can be successfully enabled. Note that the “enable” key word can be used at the same time as the last filtering criteria is defined (that is, in the Example on the previous page, the last filter rule entry could be: interface adsl 42 service-domain 3 filter-rule 4 1 priority-high l4-src-port 3074 enable).

“no” Form no service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} enable
The “no” form of this command disables the filter rule so that it can be modified or left un-configured.



NOTE: A filter rule must be inactive to be modified by deleting or changing its values. If a filter rule is enabled (as described in the next command), you must first disable the filter rule by using the “no” form of the enable command.

Defaults None

Example

```
BAS(config)# interface adsl 17 service-domain 3 filter-rule 1 1 priority-low enable
```

Related Commands adsl {<1-48>} service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>} on page 12-6
show interface adsl {<1-48>} service-domain {<1-6>} filter-rules on page 12-11

12.4 Filtering Display Commands

The following commands are used to display global filters and filtering rules that are currently active on a port-by-port basis.

```
show filters
```

Summary Displays global filter information.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays global filters that have been configured on the BAS, including the individual criteria specified for each filter.

12.4

Filtering Display
Commands**Example**

```

BAS# show filters

filter 1 ingress
  l4-dst-port
  l4-src-port

filter 2 egress
  vlan-id
  vlan-priority

filter 3 is inactive

filter 4 ingress
  src-ip

filter 5 ingress
  src-ip

filter 6 is inactive

filter 7 is inactive

filter 8 is inactive

filter 9 is inactive

filter 10 is inactive

filter 11 is inactive

filter 12 is inactive

```

Related Commands filter {<1-12>} {ingress | egress} {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} on page 12-2

```
show interface gigabit-ethernet {<1- 2>} filter-rules
```

Summary Displays enabled filtering rules for the specified gigabit Ethernet port.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters <1-2>
The gigabit Ethernet port index (1 or 2)

Description This command displays filter rules that have been configured on the gigabit Ethernet port, including the individual criteria specified for each rule.



NOTE: A filtering rule must be enabled for it to be displayed via a “show interface filter-rules” command.

Example

```
BAS# show interface gigabit-ethernet 2 filter-rules
```

```
Ingress blocking rules:
```

```
None
```

```
Egress blocking rules:
```

```
Rule 1
```

```
VLAN ID 3000
```

```
VLAN Priority 3
```

Related Commands filter {<1-12>} {ingress | egress} {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} on page 12-2

gigabit-ethernet {<1-2>} filter-rule {<1-10> <1-12>} blocking {dst-ip | dst-mac | l2-proto | l3-proto | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>} on page 12-3

gigabit-ethernet {<1-2>} filter-rule {<1-10> <1-12>} blocking enable on page 12-5

```
show interface adsl {<1-48>} service-domain {<1-6>} filter-rules
```

Summary Displays enabled filter rules for the specified ADSL port and service domain.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered <1-

Parameters 48>

The ADSL port index (up to 32 or 48 ports, depending on BAS model).

<1-6>

The selected service domain (virtual channel), indexed 1–6.

Description This command displays filtering rules that have been configured and enabled on the ADSL port and service domain, including the individual criteria specified for each rule.



NOTE: A filtering rule must be enabled for it to be displayed via a “show interface filter-rules” command.

12.4

Filtering Display Commands

12.4

Filtering Display
Commands**Example**

```
BAS# show interface adsl 32 service-domain 3 filter-rules
```

Ingress blocking rules:

None

Egress blocking rules:

None

Egress priority high rules:

```
Rule 1
  VLAN ID 3000
  VLAN Priority 3
```

Egress priority medium rules:

None

Egress priority low rules:

None

Related Commands filter {<1-12>} {ingress | egress} {dst-ip | dst-mac | l2-protocol | l3-protocol | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} on page 12-2

adsl {<1-48>} service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} {dst-ip | dst-mac | l2-protocol | l3-protocol | l4-dst-port | l4-src-port | src-ip | src-mac | tos | vlan-id | vlan-priority} {<rule-value>} on page 12-6

adsl {<1-48>} service-domain {<1-6>} filter-rule {<1-10> <1-12>} {blocking | priority-high | priority-med | priority-low} enable on page 12-8



Chapter 13

Switch Spanning Tree Configuration

13.1 Contents of this Chapter

This chapter describes the commands that configure and manage switch Spanning Tree Protocols (802.1d and 802.1w) on the Pannaway BAS. The following sections are presented in this chapter:

Topic	on page
Bridging Basics and Spanning Tree Overview	13-1
Spanning Tree Configuration Commands	13-2
Spanning Tree Display Commands	13-11

13.2 Bridging Basics and Spanning Tree Overview

In an IP network, a bridge (switch) connects two or more network segments, and controls the flow of packet between those segments by forwarding or blocking data from one segment to another. Bridges are also used to improve a network's fault tolerance by creating redundant network paths within the network. Multiple bridges can be placed in parallel on the same network, so that two or more paths can ultimately be created between network segments. Should one path fail, another path takes over automatically without significantly disrupting network traffic.

A bridged Spanning Tree is the means by which redundant paths can be created and supported. Without a Spanning Tree, a network with bridges placed in parallel would create data loops. The Spanning Tree Algorithm (STA) is an automated method for bridge communication so that only a single data route exists between any two end stations. Spanning Tree operates by selecting a controlling (root) bridge and port for the entire network, and a designated bridge and port for each segment that comprises the network. The role of a designated bridge is to forward packets to and from the root bridge onto its network segment; all other bridges on the network automatically set themselves to block/discard frames. Ultimately, this means that there is only a single available path through the network between end stations. Should one of the bridges on the network fail, Spanning Tree automatically re-configures the network so that a secondary path becomes available.

BAS version 2.2 supports a single instance of Spanning Tree. The BAS can be configured in standard 802.1d Spanning Tree Protocol mode or 802.1w Rapid (Fast) Spanning Tree Protocol (RSTP) Mode.

The difference between these two spanning tree protocols is in the convergence times when the switched network topology changes; that is – the time in which it takes the network to recover while a new bridged topology is being calculated.

13.3

Spanning Tree Configuration Commands

Typically, when 802.1d spanning tree is deployed in a network, it can take from 30-50 seconds for the network to converge after a bridge topology change. Convergence times depend on the setting of various timers. There is a delicate balance between finding the optimal setting for these timers to achieve faster network convergence and adding instability to network.

When 802.1w RSTP is the only Spanning Tree protocol on a switched network, convergence times are typically 2-3 seconds when a link failure involves point-to-point links. In normal operation, the convergence procedure for RSTP links is independent of timer settings (and the setting of timer values can therefore be considerably relaxed). RSTP uses timers as a back-up to normal operation of the protocol, and hence requires them only in worst case delay scenarios.

If the link failure involves a shared LAN link, there is no appreciable difference in convergence times between the 802.1d and 802.1w protocols.

RSTP also provides backwards compatibility with older 802.1d STP switches on a per-port basis (although this comes at the cost of losing fast convergence benefits).

Pannaway Technologies also provides an option to accelerate convergence times over those provided by the RSTP standard, so that fail-over between gigabit Ethernet links is instantaneous. This proprietary technology can be used in a network configuration using only Pannaway devices at the core of the network.

13.3 Spanning Tree Configuration Commands

The commands in the following section control the operation of the Spanning Tree protocol in the BAS, and for the individual bridging interfaces.

Switch Level Spanning Tree Settings

The following commands control operation of Spanning Tree at the switch (Bridge) level.

```
spanning-tree enable
```

Summary Enable spanning tree mode.

Required Mode Global Config

User-Entered Parameters None

Description This command sets the spanning-tree operational mode to enabled.

“no” Form no spanning-tree enable

The “no” form of this command with no options sets the spanning tree operational mode to disabled (default). While disabled, the spanning tree configuration is retained and can be changed, but is not activated.

Defaults Spanning Tree disabled

Example

```
BASR(config)# spanning-tree enabled
```

Related Commands spanning-tree mode { 8021d | 8021w | accelerated } on page 13-3

```
spanning-tree mode { 8021d | 8021w | accelerated }
```

Summary Specify the spanning tree mode used on the BAS.

Required Mode Global Config

User-Entered Parameters { 8021d | 8021w | accelerated }

The spanning tree mode operational setting for the BAS. The available options are:

- 8021d: use IEEE 802.1d compliant spanning tree mode.
- 8021w: Use fast/rapid STP mode for 802.1w compliant spanning tree operation, or for Pannaway-proprietary accelerated mode operation.
- accelerated – The accelerated option activates a Pannaway-proprietary mode to decrease network convergence times when a gigabit Ethernet link goes down.



CAUTION: The accelerated mode can only be used in a bridged network comprising of all Pannaway equipment.

In a bridged network with at least one Pannaway BAR and multiple BASs, the network configuration must meet the following requirements for using accelerated mode:

- The Root Bridge in the Spanning Tree network must be a Pannaway BAR. The root bridge must have the lowest Priority setting on the bridged network.
- If you have multiple BARs, they should be directly connected to one another (BAR-BAR). If the topology is linked so that a BAR is inserted between two BAS switches (BAS-BAR-BAS), do not enable Accelerated mode on the BAS.

Description This command sets the STP mode for the BAS and its gigabit Ethernet interfaces.

“no” Form None

Defaults Spanning Tree Mode: 802.1w

Example

```
BASR(config)# spanning-tree mode 8021d
```

Related Commands spanning-tree enable on page 13-2

```
spanning-tree bpdumigrationcheck all
```

Summary Enable Bridge Protocol Data Unit (BPDU) migration checking.

Required Mode Global Config

User-Entered Parameters None

Description When the BAS is operating in RSTP (fast) mode, this command forces the BAS gigabit Ethernet interfaces to transmit an RST BPDUs (Rapid Spanning Tree – Bridge Protocol Data Units) to test whether any legacy (802.1d STP) bridges on the attached LAN have been removed from the network. If a standard STP BPDU is received in response, the receiving interface continues to transmit STP BPDUs.

13.3

Spanning Tree Configuration Commands

13.3

Spanning Tree
Configuration
Commands

“no” Form no spanning-tree bpdumigrationcheck all
The “no” form of this command disables BPDU migration check on both gigabit Ethernet interfaces.

Defaults None

Example

```
BASR(config)# spanning-tree bpdumigrationcheck all
```

Related Commands spanning-tree bpdumigrationcheck on page 13-8

spanning-tree forward-time {<f-time>}

Summary Set the Bridge Forward Delay.

Required Mode Global Config

User-Entered Parameters <f-time>

The forwarding time, in seconds, that will be used by the BAS. The range for this value is from 4 to 30, with the value being greater than or equal to:

$$\left(\frac{BridgeMaxAge}{2}\right) + 1$$

Description This command sets the Bridge Forward Delay parameter to a new value.

When the bridge is operating in 802.1d Spanning Tree mode, the Bridge Forward Delay controls how much time the bridge spends in the listening state (in order to adjust to the Spanning Tree topology change) and learning state (to learn source MAC addresses while the spanning tree is re-configuring) before moving into the forwarding state. This parameter only takes effect when a bridge is the root bridge, which conveys it to all other bridges on the network.

When the bridge is strictly operating in 802.1w Rapid Spanning Tree mode

“no” Form no spanning-tree forward-time
The “no” form of this command sets the Bridge Forward Delay parameter back to its default value of 15.

Defaults F-time: 15

Example

```
BASR(config)# spanning-tree forward-time 16
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12
spanning-tree hello-time {<h-time>} on page 13-5
spanning-tree max-age {<bridge-max-age>} on page 13-5

13.3

Spanning Tree
Configuration
Commands

spanning-tree hello-time {<h-time>}

Summary Set the bridge hello time for the BAS.

Required Mode Global Config

User-Entered Parameters **<h-time>**
The hello time interval, in seconds, to be used on the BAS. The range for this value is from 1 to 10, with the value being less than or equal to:

$$\left(\frac{BridgeMaxAge}{2}\right) - 1$$

Description This command sets the Hello Time parameter to a new value for the common and internal spanning tree. hello time is the interval at which a bridge transmits a “hello” configuration BPDU which contains the root bridge ID, the root path cost (from the sending bridge), the sending bridge ID, and the port ID.

- If the BAS is operating in 802.1d mode, the root bridge controls the hello time interval for the entire spanning tree. The root bridge sends a “hello” BPDU at the specified Hello Time interval, and all other bridges relay the hello BPDU (updating the configuration information) only when they receive one on the root port.
- If the BAS is operating in 802.1w mode, BPDUs act as a “keep-alive” mechanism. All bridges send a BPDU containing their configuration information at the specified Hello Time interval, regardless of whether or not they receive a hello BPDU from root. If a bridge port misses three consecutive BPDUs, it assumes loss of connectivity to its neighboring root or designated bridge, and immediately ages out its existing spanning tree information.

“no” Form no spanning-tree hello-time
The “no” form of this command sets the Hello Time parameter for the common and internal spanning tree to its default value.

Defaults H-time: 2

Example

```
BASR(config)# spanning-tree hello-time 3
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12
spanning-tree max-age {<bridge-max-age>} on page 13-5
spanning-tree forward-time {<f-time>} on page 13-4

spanning-tree max-age {<bridge-max-age>}

Summary Set the bridge maximum age parameter for spanning tree operation on the BAS.

Required Mode Global Config

User-Entered Parameters **<bridge-max-age>**
The maximum age time, in seconds, that the BAS will use for spanning tree operation. The value may be from 6 to 40, with the value being less than or equal to:

$$(BridgeForwardDelay - 1) \times 2$$

13.3

Spanning Tree Configuration Commands

Description This command sets the Bridge Max Age parameter to a new value for the common and internal spanning tree.

- If the BAS is operating in 802.1d mode (or 802.1w mode with 802.1d bridges), the max age parameter is a controlling factor in how long the topology change takes. In 802.1d mode, Bridge Max age is the duration (in seconds) for which the Spanning Tree Protocol information stored by the bridge is considered valid; if it doesn't receive updated information after the maximum age time expires, it discards the existing information and initiates the topology change process to inform the root bridge, which then relays a "Topology Change BPDU" with the new topology information to the remaining bridges on the network.
- If the BAS is operating in 802.1w mode (with no 802.1d bridges on the network), a bridge may age out Spanning Tree information prior to the Max Age timer being reached. The bridge immediately ages out its STP information if three consecutive BPDUs are missed (as described in Hello Time above); otherwise, if Max Age is reached (without three BPDUs being missed) the bridge also ages out Spanning Tree information.

"no" Form no spanning-tree max-age
The "no" form of this command sets the Bridge-Max-Age parameter back to its default value of 6.

Defaults Bridge-max-age: 6

Example

```
BASR(config)# spanning-tree max-age 30
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12
spanning-tree forward-time {<f-time>} on page 13-4
spanning-tree hello-time {<h-time>} on page 13-5

spanning-tree port mode all

Summary Activate administrative switch port state on all bridge ports.

Required Mode Global Config

User-Entered Parameters None

Description This command sets the Administrative Switch Port State for all ports on the BAS to enabled.

"no" Form no spanning-tree port mode all
The "no" form of this command sets the Administrative Switch Port State for the current port to disabled. This sets both ports into a "Discarding" state, and all incoming traffic is blocked from the BAS.



CAUTION: Performing this command causes you to lose IP connectivity with the BAS. At this juncture, the BAS can only be managed through its front panel serial or management port.

Defaults Mode enabled

Example

```
BASR(config)# spanning-tree port mode all
```

Related Commands spanning-tree port mode on page 13-10
show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12

13.3*Spanning Tree
Configuration
Commands***spanning-tree priority {<bridge-priority>}**

Summary Set the BAS's priority value for calculation of the root bridge.

Required Mode Global Config

**User-Entered
Parameters**

<bridge-priority>
The bridge priority value for the BAS. The priority value is a number within a range of 0 to 61440 in increments of 4096. A lower numerical value means that the bridge has a higher priority for assuming root bridge status in the Spanning Tree network. The active switch with the lowest priority setting on the network is selected as the root bridge.



NOTE: The priority setting for the BAS should have a higher numerical value than the priority setting for a BAR on the same network.

In a network with all bridges set with the same priority value, the bridge with the lowest (hexadecimal) value of MAC address is automatically selected as root. Since this is not likely to be the desired root bridge, the priority component should be set to force the desired root.



NOTE: If the bridge priority value supplied is not a multiple of 4096, the system will return an error message indicating that an incorrect increment has been used and the priority value is unchanged.

Description This command sets the bridge priority for the BAS.

"no" Form no spanning-tree priority
The "no" form of this command sets the bridge priority to its default value of 40,960.

Defaults Bridge-priority: 40,960

Example

```
BASR(config)# spanning-tree priority 8192
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12

13.3

Spanning Tree
Configuration
Commands**Interface Level
Spanning Tree
Settings**

The following commands control operation of Spanning Tree at the individual switching interfaces.

spanning-tree bpdumigrationcheck

Summary Enable Bridge Protocol Data Unit (BPDU) migration checking for the current interface.

Required Mode Interface Config

**User-Entered
Parameters** None

Description When the BAS is operating in RSTP (fast) mode, this command enables BPDU migration checking on the selected gigabit Ethernet interface. This forces the port to issue RSTP BPDUs to check whether all legacy (802.1d STP) bridges on the attached LAN have been removed. If a standard STP BPDU is received in response, the interface continues to transmit STP BPDUs.

“no” Form no spanning-tree bpdumigrationcheck
The “no” form of this command disables BPDU migration check on the current gigabit Ethernet interface.

Defaults None

Example

```
BASR(config-if)# spanning-tree bpdumigrationcheck
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12

spanning-tree cost {<cost-value>}

Summary Set the BAS port's cost value for calculation of the path to root.

Required Mode Interface Config

**User-Entered
Parameters** <cost-value>

The cost that this port contributes when calculating the overall Root path cost in a BPDU transmitted by this bridge port. The recommended setting for this field depends on whether the BAS is operating in 802.1w RSTP mode or 802.1d STP mode.

- In 802.1d mode, path cost is a value in the range of 1–65,535. The recommended setting is $1000 / \text{LAN Speed of Connected Interface (in Mbps)}$. So, for a gigabit Ethernet interface when the BAS is in 802.1d Spanning Tree mode, the recommended setting is 1 (1000/1000 Mbps).
- For 802.1w, path cost is a value in the range of 1–200,000,000. The recommended and setting is based on link speed as follows:

Table 13-1. 802.1w Path Cost Setting

Link Speed	Recommended 802.1W Path Cost Values	Recommended 802.1W Path Cost Range
< 100 kilobits per second	200,000,000	20,000,000 - 200,000,000
1 Megabit per second	20,000,000	2,000,000 - 200,000,000
10 Megabits per second	2,000,000	200,000 - 200,000,000
100 Megabits per second	200,000	20,000 - 200,000,000
1 Gigabit per second	20,000 (BAS default)	2,000 - 200,000,000
10 Gigabits per second	2,000	200 - 20,000
100 Gigabits per second	200	20 - 2,000
1 Terabits per second	20	2 - 200
10 Terabits per second	2	1 - 20
OC-3c	128,000	12,800 - 1,280,000
OC-12c	32,000	3,200 - 320,000
OC-48c	8,000	800 - 80,000
OC-192c	2,000	200 - 20,000

Description This command sets the path cost value for the current BAS port.

“no” Form no spanning-tree cost
The “no” form of this command sets the port cost value back to its default setting.

Defaults Cost-value: 20,000 if in 802.1d or 802.1w mode.

Example

```
BASR(config-if)# spanning-tree cost 20500
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12

13.3

Spanning Tree Configuration Commands

13.3

Spanning Tree
Configuration
Commands

spanning-tree edgeport



NOTE: The action performed by this command (specifying a gigabit ethernet port as an edge port that is connected to a end station) is not applicable to network topologies that include the BAS, since the gigabit ethernet link isn't designed to be connected to an individual end station. This command is merely included for compliance with the IEE 802.1w specification, and can be operationally ignored.

spanning-tree port mode

Summary Activate administrative switch port state on the current bridge port.

Required Mode Interface Config

User-Entered Parameters None

Description This command sets the Administrative Switch Port State for the current port on the BAS to enabled.

“no” Form no spanning-tree port mode
The “no” form of this command sets the Administrative Switch Port State for the current port to disabled. This sets the port in a “Discarding” state, and all incoming traffic is blocked from the port.



CAUTION: Performing this command causes you to lose IP connectivity with the disabled port.

Defaults Mode enabled

Example

```
BASR(config-if)# spanning-tree port mode
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12

spanning-tree port-priority {<port-priority>}

Summary Set the port's priority value for calculation of the root port on this switch.

Required Mode Interface Config

User-Entered <port-priority>

Parameters The bridge port priority value for the selected interface. The priority value is a number within a range of 0 to 240 in increments of 16.

A lower numerical value means that the port has a higher priority for assuming designated port status on the bridge if two or more ports are connected to the same LAN segment. If the two ports have the same priority setting, the port with the lower interface value is selected as the designated port for the bridge.

Port priority typically need not be configured on the Pannaway BAS, since both gigabit Ethernet ports are unlikely to be connected to the same segment.

Description This command sets the port priority for the current interface.

"no" Form no spanning-tree priority
The "no" form of this command sets the bridge priority for a specific multiple spanning tree instance to its default value of 128.

Defaults Port-priority: 128

Example

```
BASR(config-if)# spanning-tree port-priority 32
```

Related Commands show spanning-tree port detailed gigabit-ethernet {<port>} on page 13-12

13.4 Spanning Tree Display Commands

The commands listed in this section display Spanning Tree statistics and settings.

show spanning-tree interface gigabit-ethernet {<port>}

Summary Display spanning tree statistics for the selected gigabit Ethernet interface.

Required Mode Privileged Exec and User Exec

User-Entered <port>

Parameters The index of the gigabit Ethernet interface on the BAS: 1 or 2.

Description This command displays statistical information about BPDU transmission on the selected interface during Spanning Tree operation.

"no" Form None

Defaults None

13.4

Spanning Tree Display Commands

13.4

Spanning Tree
Display
Commands**Example**

```
BASR(config)# show spanning-tree interface gigabit-ethernet 1
Port 1 is Enabled.
```

```

RXed RSTP BPDUs:      56
TXed RSTP BPDUs:      113840
RXed STP BPDUs:       0
TXed STP BPDUs:       0
RXed TCN BPDUs:       0
TXed TCN BPDUs:       0
```

Command Output: The following information is shown in response to the command:

Port Administrative State	Indicates if the port is Enabled or Disabled.
RXed RSTP BPDUs	The number of 802.1w RSTP (Rapid Spanning Tree Protocol) BPDUs received on the interface.
TXed RSTP BPDUs	The number of 802.1w RSTP (Rapid Spanning Tree Protocol) BPDUs transmitted on the interface.
RXed STP BPDUs	The number of 802.1d STP (Spanning Tree Protocol) BPDUs received on the interface.
TXed STP BPDUs	The number of 802.1d STP (Spanning Tree Protocol) BPDUs transmitted on the interface.
RXed TCN BPDUs	The number of Topology Change Notification BPDUs received on the interface.
TXed TCN BPDUs	The number of Topology Change Notification BPDUs transmitted on the interface.

```
show spanning-tree port detailed gigabit-ethernet {<port>}
```

Summary Show detailed spanning tree settings for a BAS bridge port.

Required Mode Privileged Exec and User Exec

User-Entered Parameters *<port>*

The index of the gigabit Ethernet interface on the BAS: 1 or 2.

Description This command displays the settings and parameters for a specific gigabit ethernet bridge port.

Much of the information displayed reflects the internal operation of the Rapid Spanning Tree protocol. This includes the current settings of multiple Boolean variables that are automatically set by the state machines as they determine the behavior of the bridge and individual ports with respect to the configuration of the spanning tree. This data is only presented as a snapshot of spanning tree operations for informative purposes, and there is little administrative benefit in viewing the settings.

Example

```

BASR(config)# show spanning-tree port detailed gigabit-ethernet 1
agreed: 1
designated priority:
  root bridge:
    priority: 0x8000          macadd:0:a:9f:40:0:ad
  root path cost:
    cost: 0
  designated bridge:
    priority: 0x8000          macadd:0:a:9f:40:0:ad
  designated port id:
    priority: 0x80    fixedval: 0x0
  rx port id:
    priority: 0x80    fixedval: 0x0
designated times:
  forward delay: 4
  hello time: 2
  message age: 0
  max age: 6
forward: 1
forwarding: 1
InfoIs: Mine
initPm: 0
learn: 1
learning: 1
mcheck: 0
message priority:
  root bridge:
    priority: 0x8000          macadd:0:a:9f:40:0:ad
  root path cost:
    cost: 0
  designated bridge:
    priority: 0x8000          macadd:0:a:9f:40:0:ad
  designated port id:
    priority: 0x80    fixedval: 0x0
  rx port id:
    priority: 0x80    fixedval: 0x0
message times:
  forward delay: 4
  hello time: 2
  message age: 0
  max age: 6
newInfo: 0
operEdge: 0
portEnabled: 1
port id:
  priority: 0x80    fixedval: 0x0
port priority:
  root bridge:
    priority: 0x8000          macadd:0:a:9f:40:0:ad
  root path cost:
    cost: 0
  designated bridge:
    priority: 0x8000          macadd:0:a:9f:40:0:ad
  designated port id:
    priority: 0x80    fixedval: 0x0
  rx port id:
    priority: 0x80    fixedval: 0x0
port times:
  forward delay: 4
  hello time: 2
  message age: 0
  max age: 6
proposed: 0
proposing: 0
rcvdBPDU: 0
rcvdmmsg: Confirmed
rcvdRSTP: 1
rcvdSTP: 0
rcvdTc: 0
rcvdTcAck: 0
rcvdTcn: 0
reroot: 0
reselect: 0
role: Designated
selected: 1
selectedrole: Designated
sendRSTP: 1
sync: 0
synced: 1
tc: 0
tcAck: 0
tcProp: 0
tick: 0
txcount: 1
updtInfo: 0
state machine timers:
  fdWhile: 0
  helloWhen: 2
  mdelayWhile: 0
  rbWhile: 0
  rcvdInfoWhile: 0
  rrWhile: 0
  tcWhile: 0

```

13.4*Spanning Tree
Display
Commands*

13.4

Spanning Tree
Display
Commands

Command Output: The following details are displayed on execution of the command:

agreed	A flag that is set to true (1) if the bridge is ONLY operating in RSTP mode, the port is associated with a point-to-point link, an RST BPDU has been received indicating the Root Port, and the Agreement flag is set (indicating the transmitting port believes the current spanning tree information to be correct). The flag is set to false (0) on reception of any a BPDU in any other state, or on transition to another port role (by the Port Role Transitions state machine)
<p>Designated Priority Details: Priority vectors are the information transmitted by RSTP bridges that are used to compute the active topology across the network and for each bridge, and assign port roles: root, designated, back-up (blocking), and alternate (blocking) as appropriate. There are several types of priority vectors. All priority vectors contain the following components:</p> <ul style="list-style-type: none"> • The Bridge Identifier of the originating Root Bridge (significant throughout the bridged LAN, and propagated and updated along each path in the active topology as configuration messages are exchanged). • The Root Path Cost for the transmitting Bridge (significant throughout the bridged LAN, and propagated and updated along each path in the active topology as configuration messages are exchanged). • The Bridge Identifier of the transmitting Bridge (locally significant, assigned hop-by-hop for each LAN or bridge for use as tie-breakers in decisions between spanning tree priority vectors in which the first two message components above are equal). • The Port Identifier of the Port through which the message was transmitted (locally significant, assigned hop-by-hop for each LAN or bridge for use as tie-breakers in decisions between spanning tree priority vectors in which the first two message components above are equal). • The Port Identifier of the Port at which the message was received (where this information is available and relevant). This is not conveyed in configuration messages, but is assigned hop-by-hop for each LAN or bridge for use as a tie-breaker in local decisions between priority vectors. <p>The following nine fields are components of the Port's <i>designated priority vector</i> value (the priority vector issued by the designated port on a given segment).</p>	
root bridge priority	The bridge priority set at the current root bridge on the network.
root bridge macaddr	The MAC address of the root bridge on the network.
root path cost	The Path Cost to the designated Root Bridge, as seen from this bridge.
designated bridge priority	The bridge priority set at the designated bridge for the attached network segment.
designated bridge macaddr	The MAC address of the designated bridge for the attached network segment.
designated port id priority	The manageable priority component of the Port Identifier set at the designated port for the attached network segment.
designated port id fixedval	The fixed component of the Port Identifier set at the designated port for the attached network segment.
rx port id priority	The port priority set at the port receiving the configuration message.
rx port id fixedval	The fixed component of the Port Identifier set at the port receiving the configuration message.

13.4

Spanning Tree
Display
Commands

Designated Times Details: The four designated times listed below are used to update Port Times values when the Port Role Selection state machine issues an update info that signals each port that there is a need to transition to new port roles.	
forward delay	The Forward Delay time set at the bridge's root port.
hello time	The Hello Time set at the bridge's root port.
message age	The Message Age time set at the bridge's root port.
max age	The Max Age time set at the bridge's root port, and incremented by either 1/16 Max Age or 1 (whichever is greater) and rounded to the nearest whole second.
forward	The administrative state for the packet forwarding function for this port provided by the Bridge Relay Entity. This is set to true (1) by the Port Role Transitions state machine to enable packet forwarding. It is set to false (0) by the Port Role Transitions state machine to instruct the Port State Transitions state machine to disable packet forwarding.
forwarding	The operational state for the packet forwarding function for this port. The Port State Transitions state machine sets this to true (1) when packet forwarding is enabled, and to false (0) when packet forwarding is disabled.
Infois	Indicates the origin/state of the Port Spanning Tree information held for the port, as follows: <ul style="list-style-type: none"> • Received – The port has received current (not aged-out) information from the Designated Bridge for the attached LAN (a point-to-point bridge link being a special case of a LAN). • Mine – Information for the port has been derived from the Root Port for the Bridge (with the addition of root port cost information). This includes the possibility that the Root Port is 'Port 0', that is, the bridge is the Root Bridge for the Bridged Local Area Network. • Aged – Information from the Root Bridge has been aged out. This is a non-persistent state. • Disabled – The port is disabled.
initPm	A variable used by the Port Protocol Migration state machine to prevent repeated re-entry into the INIT state when the Port is disabled. This is set to true (1) if the port is disabled, or false (0) if it is enabled.
learn	The administrative state for the source address learning function for this port provided by the Bridge Relay Entity. The Port Role Transitions state machine sets this to true (1) or false (0) to instruct the Port State Transitions state machine to enable or disable source address learning, respectively.
learning	The operational state of the source address learning function as set by the Port State Transitions state machine: true (1) for learning enabled or false (0) for learning disabled.
mcheck	A boolean value that can be set to true (1) by management to force the Port Protocol Migration state machine into the SEND_RSTP state; it is set to false (0) on entry into the SEND_RSTP state. This tests whether all legacy (802.1d STP) bridges on a given LAN have been removed.

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Message Priority Details: The following nine fields are components of the Port's <i>message priority vector</i> value (the priority vector values conveyed in the last BPDU received by the port).	
root bridge priority	The bridge priority set at the current root bridge on the network.
root bridge macaddr	The MAC address of the root bridge on the network.
root path cost	The Path Cost to the designated Root Bridge, as seen from this bridge.
designated bridge priority	The bridge priority set at the designated bridge for the attached network segment.
designated bridge macaddr	The MAC address of the designated bridge for the attached network segment.
designated port id priority	The manageable priority component of the Port Identifier set at the designated port for the attached network segment.
designated port id fixedval	The fixed component of the Port Identifier set at the designated port for the attached network segment.
rx port id priority	The port priority set at the port receiving the configuration message.
rx port id fixedval	The fixed component of the Port Identifier set at the port receiving the configuration message.
Message Times: The BAS port records the following four timer values as set in the last BPDU message received.	
forward delay	The Forward Delay time in the port's last received BPDU.
hello time	The Hello Time in the port's last received BPDU.
message age	The Message Age time in the port's last received BPDU.
max age	The Max Age time in the port's last received BPDU.
newInfo	A Boolean value that is set to true (1) if a BPDU is to be transmitted from the port; it is set to false (0) by the Port Transmit state machine (after transmission).
operEdge	The value of the operEdgePort parameter as defined by the operation of the Bridge Detection state machine. The value of this parameter is used by a Designated Port to determine how rapidly it may transition to the Forwarding Port State. This is set to true (1) if the port is set to operate as an Edge Port, or false (0) if any BPDUs are received on the port.
portEnabled	A Boolean value indicating the operational state of the MAC service supporting the bridge port: Disabled (0) or Enabled (1). The port enters Disabled state upon its initialization (before automatically determining its operational state), or if it is administratively disabled.
port id priority	The manageable priority component of the Port Identifier for this port. This is the fifth component of the port priority vector and designated priority vector.
port id fixedval	The fixed component of the Port Identifier for this port. This is the fifth component of the port priority vector and designated priority vector.

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Port Times: The following four timer values are currently stored for the port and are sent in its transmitted BPDUs.	
forward delay	The Forward Delay time.
hello time	The Hello Time.
message age	The Message Age.
max age	The Max Age time.
proposed	A boolean value indicating when a neighboring Designated Port (on a point-to-point link) attempts to confirm its port role and rapidly transition to forwarding state. This is initially set to false (0) by the Port Role Transitions state machine, and is set to true (1) when a configuration message received on the link carries a Proposal flag (as set by the neighboring Designated port).
proposing	A boolean value indicating when a Designated Port configured in a point-to-point link on this bridge attempts to confirm its port role and rapidly transition from some other state to a forwarding state. This is initially set to false (0) by the Port Information state machine, and is set to true (1) by the Port Role Transitions state machine when the port is to transmit a configuration message carrying a Proposal flag.
rcvdBPDU	A boolean value initially set to false (0) by the Port Information state machine, and set to true (1) when a Configuration BPDU or a TCN BPDU is received by the port, or a RST BPDU is received on the port (when in RSTP-only mode).
rcvdmmsg	This value is set when the port receives a BPDU. Possible values are: <ul style="list-style-type: none"> • Superior (the port has received a BPDU with a superior spanning tree priority) • Repeated (the port has received a BPDU with the same priority as it currently holds) • Confirmed (the BPDU was received on a point-to-point link, and had Root Port information and the Agreement flag set) • Other (the BPDU contains inferior STP priority information, or is a TCN BPDU).
rcvdRSTP	A Boolean variable set to true (1) when the port has received an RST BPDU (from upstream), and set to false (0) prior to the port transmitting an RST BPDU downstream.
rcvdSTP	A Boolean variable set to true (1) when the port receives an STP Configuration or TCN BPDU (from an upstream port in 802.1d mode) It is set to false (0) prior to the port transmitting the BPDU information downstream.
rcvdTc	A Boolean variable that is set to true (1) when the port receives a Configuration message with a Topology Change flag. It is set to false (0) by the Topology Change state machine.
rcvdTcAck	A Boolean variable that is set to true (1) when the port receives a Configuration message with a Topology Change Acknowledge flag. It is set to false (0) by the Topology Change state machine.
rcvdTcn	A Boolean variable that is set to true (1) when the port receives a Topology Change Notification (TCN) BPDU. It is set to false (0) by the Topology Change state machine.

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Spanning Tree Display Commands

reroot	Set only by the root port. If set to true (1), it instructs any other ports with the rrWhile timer still running (recent root ports) to revert to the Discarding state (and stop their rrWhile timer). The variable is set to false (0) when no port other than the Root Port has the rrWhile timer running.
reselect	Set to true (1) by the Port Information state machine if port roles are to be re-computed by the Port Role Selection state machine. The Port Role Selection state machine sets it to false (0) when it starts computation. If the Port Role Selection state machine sets it to true (1) during computation, then it repeats computation of port roles.
role	The assigned port role: Disabled, Root, Designated, Alternate, or Backup.
selected	Set to false (0) by the Port Information state machine at the same time as it sets reselect to true. The Port Role Selection state machine sets it to true (1) at the end of its computation if reselect is false.
selectedrole	A newly computed role for the port.
sendRSTP	Set to false (0) if the port is configured to send 802.1d Configuration and/or TCN BPDUs; set to true (1) if the port is configured to send RST BPDUs.
sync	A signal controlled by the root port. If set true (1), it instructs any designated port not set for Edge Port operation and that is not in agreement with the current Spanning Tree operation to revert to Discarding state (thereby establishing agreement with current Spanning Tree information). The Port Role Transitions state machine sets this to false (0) when port roles are recalculated.
synced	Set to true (1) if the port agrees with the current Spanning Tree information, otherwise set to false (0). The Port Transmit state machine uses this variable to set the value of the Agreement flag in transmitted RST BPDUs.
tc	A Boolean variable that can be set to true (1) by the Port State Transition state machine to indicate that a topology change has occurred. It is set to false (0) by the Topology Change state machine.
tcAck	A Boolean variable that is set to true (1) if a Configuration Message with a topology change acknowledge flag set is to be transmitted at the next transmission opportunity. It is set to false (0) by the Port Transmit state machine upon transmission.
tcProp	A Boolean variable that can be set true (1) by the Topology Change state machine of any other Port to indicate that a topology change should be propagated through this Port. It is set to false (0) by the Topology Change state machine.
tick	This variable is set to true (1) at one second intervals by a system clock external to the definition of the state machines. It is set to false (0) by the Port Timers state machine.
txcount	A counter used by the Port Transmit state machine to limit the maximum BPDU transmission rate per hello time period. The range of transmissions is 1 to 3 BPDUs per hello time.
updtInfo	Set to true (1) by the Port Role Selection state machine to indicate to the Port Information state machine that it should copy designatedPriority to portPriority, and designatedTimes to portTimes. Its value is set to false (0) by the Port Information state machine.

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Display
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State Machine Timers: The following seven fields are the various timer values used by the state machines while transitioning port states.	
fdWhile	The Forward Delay timer, with an initial value of Forward Delay.
helloWhen	The Hello timer used for periodic transmission of BPDUs.
mdelayWhile	The “migration delay” timer that enforces a minimum time for which RST BPDUs and Configuration BPDUs are sent in states of the Port Protocol Migration state machine. This allows time for another RSTP Bridge on the same LAN to synchronize its migration state with this Port before the receipt of a BPDU can cause this Port to change the type of BPDUs that it transmits. The timer is initialized to the value of the constant MigrateTime.
rbWhile	The “recent backup while” timer. This timer is non zero if this port is, or has recently been, a Backup Port. The initial value for this timer is twice HelloTime. The timer is set to its initial value when the Port becomes a Backup Port, and this value is maintained while the Port continues to be a Backup Port.
rcvdInfoWhile	The time remaining before the information held for this Port expires; that is, before Message Age equals or exceeds Max Age for received information on this Port.
rrWhile	The “recent root while” timer. This timer is non zero if this Port is, or has recently been, a Root Port. The initial value for this timer is Forward Delay, as communicated by the Root Bridge. The timer is set to its initial value when the Port becomes a Root Port, and this value is maintained while the Port continues to be a Root Port. The timer is set to zero if the Port becomes Discarding.
tcWhile	The interval for which Topology Change Notification (TCN) Messages are sent through the Root Port and for which Configuration Messages are sent with the Topology Change flag set. The newTcWhile procedure determines the starting value of this timer.

Related Commands

- spanning-tree enable on page 13-2
- spanning-tree mode { 8021d | 8021w | accelerated } on page 13-3
- spanning-tree bpdumigrationcheck all on page 13-3
- spanning-tree forward-time {<f-time>} on page 13-4
- spanning-tree hello-time {<h-time>} on page 13-5
- spanning-tree max-age {<bridge-max-age>} on page 13-5
- spanning-tree port mode all on page 13-6
- spanning-tree priority {<bridge-priority>} on page 13-7
- spanning-tree bpdumigrationcheck on page 13-8
- spanning-tree cost {<cost-value>} on page 13-8
- spanning-tree port-priority {<port-priority>} on page 13-11

show spanning-tree summary

Summary Show spanning tree summary information.

Required Mode Privileged Exec and User Exec

User-Entered Parameters None.

Description This command displays basic spanning tree information for the BAS.

"no" Form None**Defaults** None**Example**

```

BASR# show spanning-tree summary
Port 1 is Enabled.
Port Role: Root
Port State: Forwarding
Port 2 is Disabled.

```

Command Output: The command returns the following information for Port 1 and Port 2:

Port Operational State	Indicates if the port is Enabled or Disabled.
Port Role	Indicates the currently assigned port role. For 802.1w operation, assigned port roles are Root, Designated, Alternate, or Backup. Port role is not applicable to 802.1d operation.
Port State	Indicates the current state of the port in the Spanning Tree topology: For 802.1w operation, possible states are Discarding, Learning, or Forwarding. For 802.1d operation, possible states are Disabled, Blocking, Listening, Learning, or Forwarding.

Related Commands spanning-tree port mode all on page 13-6
spanning-tree port mode on page 13-10

13.4

Spanning Tree Display Commands



Chapter 14

Ethernet Automatic Protection Switching

14.1 Contents of this Chapter

This chapter describes the commands that configure and manage Ethernet Automatic Protection Switching (EAPS) on the Pannaway BAS. The following sections are presented in this chapter:

Topic	on page
Ethernet Automatic Protection Switching Overview	14-1
General Procedures for Implementing EAPS	14-3
EAPS Configuration Commands	14-6
EAPS Display Commands	14-9

14.2 Ethernet Automatic Protection Switching Overview

Ethernet Automatic Protection Switching (EAPS) is a technology to improve resiliency for Ethernet fiber ring networks in a Metropolitan or large Local Area Network, so that ring fail-over times and reliability are comparable to that of SONET rings. After a fiber cut, an EAPS ring can converge in less than one second (typically in less than 50 milliseconds). Moreover, EAPS does not have the ring-size constraints of SONET, and is easy to configure and deploy.

An EAPS domain is comprised of Ethernet nodes deployed in a single ring, with two ports per-node connected to the ring. All ring ports participate in an EAPS VLAN that isolates ring control traffic from data traffic transmitted on other protected VLANs. An EAPS domain has a single “Master” node, with all other nodes acting as “Transit” nodes. The Master node’s two ring ports are designated as the active “primary” port and the standby “secondary” port.



NOTE: Transit nodes also have designated primary and secondary ports; however, there is no practical distinction between these ports unless the node is acting in a Master capacity. The secondary port on a transmit node does automatically go into blocking while the ring is coming up (to prevent a loop during initialization), otherwise in normal operation it is unblocked, as is the master port.

14.2

Ethernet Automatic Protection Switching Overview

In normal operation, the Master node blocks any transmitted/received data traffic on the protected VLANs from passing through its secondary port, so that no network loop is detected. As long as the ring is intact, the Master's primary port transmits non-control data in a uni-directional flow around the ring, and terminates it at the secondary port. Control packets on the EAPS VLAN are not blocked and are passed through the ring.

Two methods are used to determine ring state:

- First, the Master node polls itself over the ring to ensure that a round-trip transmission can occur before a fail-period timer expires. The Master transmits a "health check" control frame (via the EAPS VLAN) at a user-configurable interval. If this frame is received at its secondary port before the fail-period timer expires, the Master assumes that the ring is intact and resets the fail-period timer before transmitting the next health check packet. If the fail-over period expires before the health check packet is received, the Master assumes that a ring break has occurred and acts to restore ring communications.
- Second, each Transit node monitors its own ports for link-down state. If it detects a loss of link on one of its two transmission ports, it sends a link-down trap in the direction of the Master node over the active port. Again, immediately upon receiving a link-down message, the Master acts to restore ring communications.

In the event that the Master detects a ring fault (either through self-polling or received trap), the Master declares a failed state and the following actions occur:

- The Master unblocks its secondary port for transmitting data traffic so that data can flow bi-directionally to reach all stations on the ring.
- The Master flushes its forwarding database so that it re-learns the network topology appropriately.
- The Master transmits a control frame instructing all Transit nodes to flush their filtering databases, so that they can determine the correct layer-2 topology to reach the other stations across the reconfigured ring.
- The Master continues to transmit health check packets from its primary port so that it can determine when the primary path connectivity is restored.

As long as the ring is down, the Master's self-poll will fail and the secondary transmission path remains open; however, once the Master receives the health check packet on its secondary port, it takes the following actions to restore primary path communications:

- It sets the secondary port back into a blocking state.
- It flushes its forwarding database to re-learn the network topology, and sends a control frame to alert Transit nodes to flush their forwarding database as well.

While the ring is being restored, there is a brief interval between when the Transit node detects that its link is operable and the Master node detects that the ring is restored in which the possibility of a temporary data loop exists (since data is still being sent from the Master's secondary port until primary path communications are fully restored). To prevent this loop, the Transit node that detects link-up will temporarily block traffic on the protected VLANs from traversing the newly restored link, and will set that link into a "pre-forwarding" state.

When the Transit node receives the alert to flush its forwarding database, it can safely transition the blocked port from a pre-forwarding state into a forwarding state.

Pannaway's implementation of EAPS has the following restrictions:

- Pannaway's implementation supports up to 40 nodes in an EAPS domain.
- Currently, the BAS does not allow Rapid Spanning Tree Protocol (RSTP) and EAPS to be enabled simultaneously on the device OR on the ring network.
- The BAS supports EAPS on either a copper gigabit uplink or a fiber gigabit uplink; however, fast (50 ms) fail-over is only supported on fiber optic links.
- The BAS implementation of EAPS should be inter-operable with other vendors' EAPS-capable products; however, the 50 ms fail-over time is not guaranteed when other vendors' equipment is used.
- Per the EAPS protocol, the EAPS VLAN must be reserved exclusively for EAPS control traffic. No IP host can be provisioned on this VLAN, or a network loop will occur and instability may result.
- Primary and secondary ports are fixed on the BAS. Gigabit Ethernet 1 is always the primary port and Gigabit Ethernet 2 is always the secondary port. User selection of the primary and secondary port is not supported.

14.3

General Procedures for Implementing EAPS

14.3 General Procedures for Implementing EAPS

You must be very careful when implementing EAPS for the first time, and it requires that the deployment be pre-planned before it is carried out. If you misconfigure EAPS when deploying it for the first time, it could result in a significant network outage requiring a truck roll to fix the issue. Use the following guidelines for a successful deployment of EAPS.



NOTE: Currently, Pannaway's Broadband Access Router (BAR) does not support EAPS, so while an EAPS ring comprised entirely of BAS nodes can be deployed, there is no practical means to inject multicast streams into the network until BAR support for EAPS is implemented.

For a live network deployment, this means that you must currently use a third party Access Switch that supports EAPS for a gigabit uplink to voice/video/data services. This switch may or may not act as the Master node on the ring.

For a test network deployment, you can implement an EAPS ring using only BAS nodes, and source multicast streams from a properly provisioned ADSL port.

- Decide on the VLAN ID that are going to use for the EAPS VLAN. This VLAN must be available for assignment on all nodes participating in the EAPS ring.
- If Rapid Spanning Tree Protocol (RSTP) is running on the ring, you must disable it before you can perform any EAPS configuration. Plan an appropriate window of time in which you can make the transition from RSTP to EAPS.

14.3

General Procedures for Implementing EAPS

- Make sure that all physical connections are made correctly to all BAS nodes in the EAPS ring. Gigabit Ethernet 1 must be the primary port and Gigabit Ethernet 2 must be the secondary port.
- Disconnect the secondary port (GE 2 if BAS) at the EAPS Master node in the central office to prevent a network loop during EAPS deployment/configuration.
- If Rapid Spanning Tree Protocol (RSTP) is deployed on the EAPS Master, disable it so that EAPS can be configured.
- Provision the EAPS VLAN on the desired Master node, enable Master status for the node, edit the EAPS timers if necessary, and then enable EAPS on the Master node only.



CAUTION: Do not restore the link on the Master node's secondary port at this time.

- Disable RSTP on all BAS Transit nodes if necessary.
- Provision the EAPS VLAN on each BAS Transit node. The order in which you configure Transit nodes does not matter. No timer configuration is required for transit nodes.



CAUTION: Do not enable EAPS on the Transit nodes at this time.

- After the EAPS VLAN is configured on all transit nodes, reconnect the secondary (GE 2) port on the Master node to close the ring, initialize "health check" control frame transmission, and begin EAPS operation on the Master. The Master will block its secondary port.
- Enable EAPS on each BAS acting as a Transit node in any order, although typically you would start with the furthest node from the Master (around the ring), and end with the nearest node to the Master.

When EAPS is enabled, the BAS Transit node blocks its secondary port to data (non-EAPS control) traffic and sends a link down packet to the Master. As a result the Master transitions to ring fault state, but immediately transitions to ring complete state upon receiving its own health check frames. The Master then transmits flush and unblock commands to the Transit node so that it unblocks its secondary port to data traffic.

The following diagram illustrates the EAPS deployment procedure for a live network or test network deployment:

14.3

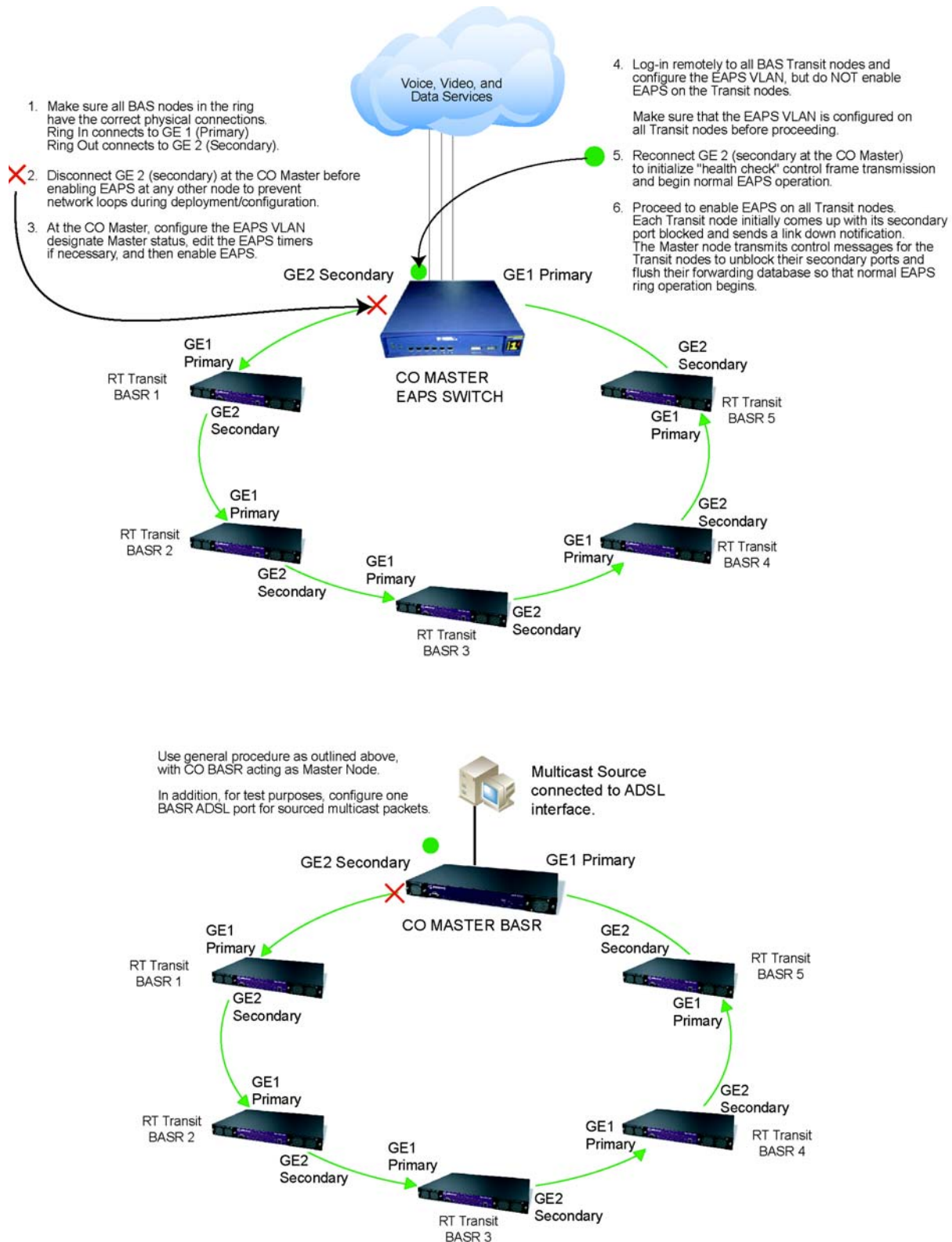
General
Procedures for
Implementing
EAPS

Figure 14-1. Example EAPS Deployment

14.4 EAPS Configuration Commands

The commands in the following section control the operation of the EAPS protocol in the BAS, and for the individual gigabit interfaces.

14.4

EAPS Configuration Commands

configure vlan {<vlanid>} eaps

Summary Create the EAPS VLAN.

Required Mode Privileged Exec, Global Config

User-Entered Parameters <vlanid>

A numerical valid VLAN identification number. The range for this field is 1-4094, excluding the reserved default VLANs that have the range of 4060-4065.

Description This command creates a new VLAN in the BAS VLAN database for EAPS communications, and assigns it an ID. The same VLAN ID must be configured for EAPS operation at all nodes participating in the ring (all Transit nodes and the Master node).

“no” Form no vlan eaps {<vlanid>}

The “no” form of the command deletes the existing EAPS VLAN, as specified by its <vlanid>.



CAUTION: EAPS cannot be simultaneously enabled with Spanning Tree. A warning message appears if Spanning Tree is already enabled, and the VLAN is not created.

In addition, the EAPS VLAN cannot be edited or deleted if EAPS is currently enabled. You must disable EAPS before making any changes to the VLAN.

Defaults None

Example

```
BASR(config)# vlan 3090 eaps
```

Related Commands show eaps on page 14-9

eaps enable

Summary Enable Ethernet Automatic Protection Switching on the BAS.

Required Mode Global Config

User-Entered Parameters None

Description This command sets the Ethernet Automatic Protections Switching mode to enabled for this BAS.



CAUTION: EAPS cannot be simultaneously enabled with Spanning Tree. A warning message appears if Spanning Tree is already enabled.

EAPS cannot be enabled if there is no EAPS VLAN configured on the BAS. You must create an EAPS VLAN before enabling EAPS mode.

Finally, you must consider the order in which you activate and physically connect EAPS nodes on the ring. Deploying EAPS indiscriminately can cause you to lose contact with downstream nodes. Refer to “General Procedures for Implementing EAPS” for more information.

“no” Form no eaps enable

The “no” form of this command with no options sets the EAPS operational mode to disabled (default). While disabled, the EAPS configuration is retained and can be changed, but is not activated.

Defaults EAPS disabled

Example

```
BASR(config)# eaps enable
```

Related Commands show eaps on page 14-9

eaps fail-timer {<1000-600000>}

Summary Configure the fail-period timer on the BAS if it is acting as the Master node.

Required Mode Global Config

User-Entered Parameters **<1000-600000>**

The duration, in milliseconds, of the fail-period timer.

Description This command sets the value of the fail-period timer. This value only needs to be set if the managed BASR is to be used as the Master node on the EAPS ring. A health check packet must traverse the ring within the fail-period timer duration, or the Master declares a ring fault and starts the recovery procedure.

The fail-period timer must be greater than the health-check timer interval.

“no” Form no eaps fail-timer

The “no” form of this command restores the default fail-period timer value.

Defaults Fail-period Timer: 3000 milliseconds (3 seconds)

Example

```
BASR(config)# eaps fail-timer 1500
```

Related Commands eaps health-check {<1000-600000>} on page 14-8
show eaps on page 14-9

14.4

EAPS Configuration Commands

14.4

EAPS
Configuration
Commands

eaps health-check {<1000-600000>}

Summary Configure the health-check timer on the BAS if it is acting as the Master node.

Required Mode Global Config

User-Entered Parameters **<1000-600000>**
The duration, in milliseconds, of the health-check timer.

Description This command sets the value of the health-check timer. This value only needs to be set if the managed BASR is to be used as the Master node on the EAPS ring.

The Master node transmits a health check packet from its primary port at the given health-check interval. A health check packet must traverse the ring before the fail-period timer expires, or the Master declares a ring fault and starts the recovery procedure. If a health check packet is successfully received at the Master's secondary port before the fail-period timer expires, the fail-period timer is reset.

The health-check timer interval must be less than the fail-period timer interval.

"no" Form no eaps health-check
The "no" form of this command restores the default health-check timer value.

Defaults Health-check Timer: 1000 milliseconds (1 second)

Example

```
BASR(config)# eaps health-check 1100
```

Related Commands eaps fail-timer {<1000-600000>} on page 14-7
show eaps on page 14-9

eaps master-enable

Summary Configures the BASR as the Master node on the EAPS ring.

Required Mode Global Config

User-Entered Parameters None

Description This command sets the BASR as the Master node on the EAPS ring. The Master node is responsible for determining ring status, declaring ring faults (detected through the self-poll method or a received "Link Down" trap), and initializing ring reconfiguration and recovery procedures.



CAUTION: There must only be one Master node on the EAPS ring. If there are two provisioned Master nodes, the ring recovery mechanism does not function – since one master will detect a “link down” message but the other will not, leading one to declare a ring fault and the other to assume the ring is still complete. In addition, the self-polling mechanism of the Master node loses synchronization since two sets of health check packets are circulating the ring.

If a BAS acting as Master detects a health check packet from a different source MAC address than its own, it will issue a “Duplicate EAPS master detected” event message on a periodic basis until the condition is cleared when the other Master is switched into Transit node mode. However, there is no automatic means of detecting another Master on the ring at the time you enable Master node state.

“no” Form no eaps master-enable
The “no” form of this command restores the BASR to Transit node status.

Defaults Mode: Transit

Example

```
BASR(config)# eaps master-enable
```

Related Commands show eaps on page 14-9

14.5

EAPS Display Commands

14.5 EAPS Display Commands

The commands listed in this section display EAPS statistics and settings.

```
show eaps
```

Summary Displays configuration and state information for EAPS Master and Transit nodes.

Required Mode User Exec or Privileged Exec

User-Entered Parameters None

Description This command displays configuration and state information for EAPS on a Master or Transit node. The Master node information includes ring state, port state, EAPS timer, VLAN ID, and event/message log information. The transit node information includes port state and VLAN ID information.

“no” Form None

Defaults None

Example

```
BASR# show eaps
```

```

                EAPS: enabled
                Node type: master
                Ring state: healthy
                Primary Link (GIG 1): UP
                Secondary Link (GIG 2): UP BLOCKED
                EAPS VLAN: 4000
                Health check interval (ms): 1000
                Fail timer interval (ms): 3000

                Total link down events      1
                Total fail timer expiries 0

                Last link down report time 2006-08-02 17:00:42

```

```
Most recent nodes reporting link down:
```

```
2006-08-02 17:00:42      MAC address 00:0a:9f:40:43:ac
```

```
BASR# show eaps
```

```

                EAPS: enabled
                Node type: transit
                Primary Link (GIG 1): UP
                Secondary Link (GIG 2): UP BLOCKED
                EAPS VLAN: 4000

```

Command Output: The following information is shown in response to the command:

EAPS	Status indicator for EAPS Enabled/Disabled state on the BAS.
Node Type	Indicates master or transit.
Ring State	The operational state of the ring: healthy (ring complete) or fault (ring fault failure).
Primary Link (GIG 1)	The operational (UP or DOWN) and administrative (BLOCKED or not) state of the link.
Secondary Link (GIG 2)	The operational (UP or DOWN) and administrative (BLOCKED or not) state of the link.
EAPS VLAN	The VLAN Identifier associated with the EAPS VLAN.
Health check interval (ms)	For Master only. The configured health check interval, in milliseconds.
Fail Timer interval (ms)	For Master only. The configured fail timer interval, in milliseconds.
Total link down events	For Master only. The number of link down events reported on the ring (since last BAS initialization).
Total fail timer expires	For Master only. The number of times the fail timer interval expired before a health check packet was received (since last BAS initialization).
Last link down report time	For Master only. The date- and timestamp (in YYYY-MM-DD and 24-hour HH:MM:SS format) of the last link down message received by the Master (based on the Master's system clock).

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EAPS Display Commands

Most recent nodes reporting link down	For Master only. The date- and timestamp of the last link down message received by the Master, along with the physical (MAC) address of the reporting node. Note that the message list stores up to 10 link down messages, after which the oldest message is overwritten upon receiving a new link down alert.
---------------------------------------	---

14.5

EAPS Display
Commands

14.5

EAPS Display Commands



Chapter 15

Diagnostic, Test, and Maintenance Commands

The following commands can be used to troubleshoot communications across the BAS, to view a session history to determine possible misconfiguration of the device, perform a device bootram or firmware upgrade, or reboot the BAS.

15.1 Contents of this Chapter

The following topics are discussed in this chapter:

Topic	on page
General Diagnostic and Test Commands	15-1
Firmware Commands	15-5
Start-up and Running Config Management Commands	15-7
System Logging Commands	15-13
Diagnostic File Commands	15-20
ADSL Loopback Tests	15-21
ADSL Line Tests	15-23
Metallic Test Access Ports Commands	15-31

15.2 General Diagnostic and Test Commands

The commands described in this section provide general diagnostic and test commands that can be used to locate recently submitted input errors, view recent provisioning history, show version information, or test connections to other network hosts.

history

Summary Show a list of the CLI commands entered during this session.

Required Mode User Exec or Privileged Exec

User Entered Parameters None

15.2

General
Diagnostic and
Test Commands

Description The “history” command shows a list of the most recent commands entered at the current CLI mode. Up to 30 commands are listed, in ascending numerical order, from the earliest command up to and including the “history” command.

“no” form None

Defaults None

Example

```
BASR> history
1 echo this
2 show sysinfo
3 show hardware
4 history
```

show provisioning-log [oldest-first]

Summary Display the contents of the BAS’s Provisioning log.

Required Mode Privileged Exec

User Entered Parameters *!oldest-first!*

The default sort order is to display the most recently performed provisioning command at the top of the command output.

Specifying the oldest-first option displays the output in reverse-chronological order, so that the oldest log entry is displayed at the top of the command output and the newest entry at the bottom.

Description The BAS maintains a Provisioning log which records provisioning (configuration) commands performed upon the BAS. When a provisioning command is performed, an entry is made in the log that indicates the command type, as well as the Pass/Fail result of the provisioning attempt. This log is a circular buffer that can store up to 250 messages before overwriting the oldest entries with the most recent ones.

This command shows the contents of the BAS’s Provisioning log.

The log is stored in the BAS’s non-volatile memory, so log entries are persistent across reboots of the device.

“no” form None

Defaults None

Example

```

BASR# show provisioning-log

Command..... log-monitor enable
Timestamp..... 2006-08-09 13:55:09
Connection Type... TELNET
IP Address..... 172.16.1.194
Login ID..... Admin
Mode..... PRIV-EXEC
Result..... PASS

Command..... configure log console adsl low
Timestamp..... 2006-08-09 13:56:32
Connection Type... TELNET
IP Address..... 172.16.1.194
Login ID..... Admin
Mode..... PRIV-EXEC
Result..... PASS

Command..... configure log console event low
Timestamp..... 2006-08-09 13:56:42
Connection Type... TELNET
IP Address..... 172.16.1.194
Login ID..... Admin
Mode..... PRIV-EXEC
Result..... PASS

```

15.2*General
Diagnostic and
Test Commands*

Command Output: The following information is shown in the Provisioning log:

Command	The actual command input (command line text).
Timestamp	The timestamp associated with the provisioning command. This timestamp reflects the time at which the command was performed (based upon the system clock setting) in YYYY-MM-DD HH:MM:SS format.
Connection Type	Indicates if a local (CONSOLE) or remote (TELNET or SSH) connection was used for the command entry.
IP Address	If a remote connection, the IP address of the host used to access the BAS.
Login ID	The login name used to access the BAS.
Mode	The execution mode at the time the command was run.
Result	This always indicates either PASS (command was performed successfully) or FAIL (command failed to execute).

Related Commands clear provisioning-log on page 15-3

clear provisioning-log

Summary Deletes all entries in the Provisioning log.

Required Mode Global Config

**User Entered
Parameters** None

Description This command deletes all entries currently in the Provisioning log.

15.2

General
Diagnostic and
Test Commands**"no" form** None**Defaults** Enabled**Example**

```
BASR# clear provisioning-log
```

Related Commands show provisioning-log [oldest-first] on page 15-2

```
ping {<ip address> | <hostname>}
```

Summary Send a PING to the specified host.**Required Mode** Privileged Exec**User Entered Parameters** *<ipaddress>*

The IP address, in dotted decimal notation, of an IP interface to send the PING message to.

<hostname>

The host name of an IP device to send a PING request to. The BAS must have access to an operating and up-to-date DNS system that can resolve the host name in order for this parameter to be used.

Description This command generates a Packet Internet Groper (PING) request that is addressed to the specified host IP address or hostname. If the host is reachable and operating, a response message will be displayed, indicating that the specified host received the PING and responded. If the host cannot respond, the CLI will display a notification that the PING request timed out.

"no" form None**Defaults** None**Example**

```
BASR# ping 10.10.3.1
10.10.3.1 is alive
```

```
show hardware
```

Summary Display summary information about the BAS hardware.**Required Mode** Privileged Exec**User Entered Parameters** None

Description This command shows a limited set of information about the manufactured characteristics of the BAS, including system identifying information, system and firmware descriptions, and hardware addressing information.

"no" form None

Defaults None**Example**

BASR# show hardware

```

Vendor..... Pannaway Technologies
System Description.. Pannaway BASR 1.3.11 Oct 14 2004, 15:50:06 builder.pannaway.com
Serial Number..... 1104330010001237116
CLEI code..... 1104330010001237116
Part Number..... 1104330010001237116
Hardware Version.... C
Manufacturer..... C
MAC address..... 00:0a:9f:40:02:01
DSP MAC address.... 00:0a:9f:40:02:02
Firmware Version.... Pannaway BASR 1.3.11 Oct 14 2004, 15:50:06 builder.pannaway.com
Boot Loader Version. BASR-B00TRAM 1.3.11 2004-10-14T15:49:24-0400

```

Command Output: The following information is shown in the hardware description:

Vendor	The vendor name (Pannaway Technologies).
System Description	The SNMP MIB-II system description assigned by Pannaway Technologies to the BAS.
Serial Number	The manufacturer-set serial number of the BAS.
CLEI Code	The Telcordia-standard Common Language Equipment Identifier (CLEI) code assigned to the BAS at manufacture. By default, this is the same as the serial number.
Part Number	The manufacturer-set part number of the BAS. Currently, this is the same as the serial number.
Hardware Version	The circuit board revision level.
Manufacturer	Currently, the circuit board revision level.
MAC Address	The factory-set MAC address of the BAS's host interface.
DSP MAC Address	The factory-set MAC address of the BAS's DSP interface.
Firmware Version	The current version of operating firmware.
Boot Loader Version	The current version of Boot RAM code.

15.3 Firmware Commands

The commands presented in this section deal with the updating, saving, and verification of BAS firmware and boot code.

```
copy url {<url>} firmware
```

Summary Load updated firmware to the BAS.**Required Mode** Privileged Exec**User Entered** <url>

Parameters A valid uniform resource locator (URL) that specifies a valid Pannaway firmware image location. The URL must include the name or address of a valid FTP server, and the directory path and filename of the firmware image.

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Description This command copies a firmware file from the specified FTP server to the BAS's system memory. When the command is entered, a confirmation dialog is presented. To start the process, you must enter "yes" at the prompt.

The BAS provides a progress indicator for the download of the image file. Once the firmware image is copied, you are prompted whether to reboot the BAS. If you decide to delay a reboot, the BAS must be restarted at a later time with the "reload" command to begin using the new image.



CAUTION: Verify the successful completion of the firmware download (using the "show firmware" command) after restarting the BAS.

"no" form None

Defaults None

Example

```
BASR# copy url ftp://anonymous:guest@192.168.0.1/BASR_PKG_2.1.5 firmware
This will update the firmware image, continue (yes/no)? yes
FTP progress: #####
```

Related Commands show hardware on page 15-4
show firmware on page 15-6
reload [now] on page 15-8

show firmware

Summary Display the current bootram and firmware images.

Required Mode Privileged Exec

**User Entered
Parameters** None

Description This command displays the currently saved firmware and bootram version information for the BAS. The command shows the version number and build date for the firmware and hardware that are currently in system memory, and which will be loaded the next time the BAS is initialized.

"no" form None

Defaults None

Example

```
BASR# show firmware

Firmware Version: Pannaway BASR 2.2.5 May 15 2006, 15:50:06 builder.pannaway.com
Boot Loader Version: BASR-B00TRAM 2.2.5 2000-05-15T15:49:24-0400
```

Related Commands copy url {<url>} firmware on page 15-5

15.4 Start-up and Running Config Management Commands

The commands in this section display and control the configuration and start-up settings of the BAS.

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*Start-up and
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clear startup-config

Summary Restore the BAS's system default configuration.

Required Mode Privileged Exec

User Entered Parameters None

Description This command is used to erase the contents of the BAS's start-up configuration file and restore the system to its default settings. The BAS will display a warning and a confirmation prompt. Confirming the operation causes the BAS to reboot, ending the management session.



CAUTION: If you are managing the BAS remotely via a Telnet connection, this will cause you to lose connectivity to the device as its management IP address is reset to 0.0.0.0.

"no" form None

Defaults None

Example

```
BASR# clear startup-config
About to clear startup-config and reboot. Continue (yes/no)? y
```

Related Commands show startup-config on page 15-11
write erase on page 15-12

copy startup-config {<url>}

Summary Save the BAS's start up configuration file.

Required Mode Privileged Exec

User Entered Parameters **<url>**
A valid uniform resource locator (URL) that specifies an FTP server, directory path, and filename that the startup configuration will be saved to.

Description This command is used to save the BAS's start up configuration file to a remote FTP server.



NOTE: If the target directory already contains a file with the same name as the one specified in the <url> parameter, an "access denied" error is generated.

"no" form None

Defaults None

Example

```
BASR# copy startup-config ftp://anonymous:guest@172.16.1.187/upload/BAS012704config
```

Related Commands show startup-config on page 15-11

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Start-up and Running Config Management Commands

reload [now]

Summary Reboot the BAS.

Required Mode Privileged Exec

User Entered Parameters */now/*

If the optional “now” parameter is supplied, the BAS will reboot immediately, without requiring confirmation.

Description This command reboots the BAS, and loads the current firmware and bootram images from system memory. The BAS will display a warning and a confirmation prompt if the optional “now” parameter is not supplied. Confirming the operation causes the BAS to reset, ending the management session.

“no” form None

Defaults None

Example

```
BASR# reload
This will restart the system, are you sure (y/n)? y
```

startup-output enable

Summary Display the current start-up configuration at boot-up.

Required Mode Global Config

User Entered Parameters None.

Description This command activates the display of the start-up configuration at boot time.

“no” form no start-up output enable
The “no” form of this command prevents the start-up configuration from being displayed at boot-up.

Defaults Disabled

Example

```
BASR(config)# startup-output enable
```

Related Commands show startup-config on page 15-11

show running-config

Summary Display currently running configuration.

Required Mode Privileged Exec

User Entered Parameters None

Description This command displays information about the currently running system configuration on the BAS. This shows any changes that have been made to the BAS through a configuration (config) command, and any changes that have been saved to FLASH memory.



TIP: You can copy and paste from the command output to simplify the configuration of multiple ADSL ports. To do so:

- Complete the configuration of an ADSL port (for example, Port 1).
- Perform the “show running-config” command. The configuration of Port 1 displays.
- Highlight the configuration text for Port 1 and copy it.
- Enter interface configuration mode for a new port (Port 6) for example, so that the command prompt reads BASR(config-if)#.
- Paste the configuration text after the command prompt, and press Enter. All configuration commands are performed.

“no” form None

Defaults None

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Example

```

BASR# show running-config
#
# Pannaway Technologies
#
no ip ssh
no snmp-server community mode read-only
snmp-server community name read-write net_admin
log server 172.16.1.187
log network adsl lowest
log network panmain event
log network diags lowest
log network systime event
ip address 192.168.1.55 255.255.255.0
ip domain-name pannaway.com
ip name-server 172.16.1.5
ip default-gateway 192.168.1.1
dialplan northamerica
sip proxy host 172.16.1.187
sip registration host 172.16.1.187
voice ip address 192.168.1.99
voice dial-peer lifeline 15 1234567
voice dial-peer lifeline 14 1237654
voice dial-peer pots 13 1235647
#
#
interface adsl 1
    adslalarmconfprofileexttable adslatucthreshold15minfailedfastr 500
    adslalarmconfprofileexttable adslatucthreshold15minsesl 920
    adslconfprofileexttable adslconfprofilelinetype fastonly
    adsllineconfprofiletable adsllineconfprofilerowstatus outofservice
    exit
interface adsl 2
    start
    adsllineconfprofiletable adsllineconfprofilerowstatus outofservice
    adsllineconfprofiletable adslatucconfmaxbitsperbin 15
    adsllineconfprofiletable adsllineconfprofilerowstatus active
    exit
interface adsl 8
    adsllineconfprofiletable adsllineconfprofile 14
    exit
interface adsl 13
    adsllineconfprofiletable adslatucconfdownshiftsnrmgn 15
    adsllineconfprofiletable adslatucconfcodinggain 5db
    exit
#

```

15.4*Start-up and
Running Config
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show startup-config

Summary Show the currently saved start-up configuration.

Required Mode Privileged Exec

User Entered Parameters None

Description This command shows the start-up configuration that has been stored in the BAS FLASH memory through the use of the “write-memory” command.

“no” form None

Defaults None

Example

```
BASR# show startup-config
#
# Pannaway Technologies
#
no ip ssh
no snmp-server community mode read-only
snmp-server community name read-write net_admin
log server 172.16.1.187
log network adsl lowest
log network panmain event
log network diags lowest
log network systime event
ip address 192.168.1.55 255.255.255.0
ip domain-name pannaway.com
ip name-server 172.16.1.5
ip default-gateway 192.168.1.1
dialplan northamerica
sip proxy host 172.16.1.187
sip registration host 172.16.1.187
voice ip address 192.168.1.99
voice dial-peer lifeline 15 1234567
voice dial-peer lifeline 14 1237654
voice dial-peer pots 13 1235647
#
interface adsl 1
    adslalarmconfprofileexttable adslatucthreshold15minfailedfastr 500
    adslalarmconfprofileexttable adslatucthreshold15minsesl 920
adsllineconfprofiletable adsllineconfprofilerowstatus outofservice
exit
interface adsl 8
    adslINETable adsllineconfprofile 14
exit
interface adsl 13
    adsllineconfprofiletable adslatucconfdownshiftsnrmgn 15
    adsllineconfprofiletable adslatucconfcodinggain 5db
exit
#
```

Related Commands copy startup-config {<url>} on page 15-7
 startup-output enable on page 15-8
 write memory on page 15-12

15.4

Start-up and Running Config Management Commands

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Start-up and
Running Config
Management
Commands

write erase

Summary Erase the contents of the BAS's running configuration file.

Required Mode Privileged Exec

User Entered Parameters None

Description This command is used to erase the contents of the BAS's running configuration file by performing a "no config" command for every corresponding "config" command in the file. This effectively restores the system to its default settings. The BAS will display a warning and a confirmation prompt. Confirming the operation does *not* cause the BAS to reboot; however, if you are connected remotely your Telnet management session is terminated.



CAUTION: If you are managing the BAS remotely via a Telnet connection, this will cause you to lose connectivity to the device as its management IP address is reset to 0.0.0.0.



NOTE: As long as you don't save your configuration after performing a write erase, its consequences are reversible since the start-up configuration file remains intact (unlike after performing a "clear start-up config"). Simply reboot your BAS to restore the previous start-up configuration file *before* saving the configuration after performing a write erase.

"no" form None

Defaults None

Example

```
BASR# write erase
This will reset the system to its default configuration (yes/no)? y
```

Related Commands show startup-config on page 15-11
clear startup-config on page 15-7

write memory

Summary Saves the running configuration to the start-up configuration.

Required Mode Privileged Exec

User Entered Parameters None

Description This command saves the current running configuration to the start-up configuration that is run each time the BAS is re-initialized. Performing the "write memory" command during a log-in session saves any configuration changes that have been made across system reboots.

"no" form None

Defaults None**Example**

```
BASR# write memory
BASR#
```

Related Commands show running-config on page 15-9
show startup-config on page 15-11

15.5

System Logging
Commands

15.5 System Logging Commands

The commands in this section display the contents and settings of the BAS system logs. The information in these system logs can be helpful in isolating faults and discovering configuration or operational problems in conjunction with other troubleshooting and service operations.

```
log server {<ip address> | <hostname>}
```

Summary Configures a syslog server.**Required Mode** Global Config**User Entered Parameters** *<ip address> / <hostname>*

The IP address or host name of the syslog server to which BAS log messages are to be sent.

Description Configures a syslog server for any logged messages with a *network* destination, as specified by the *log {destination} {subsystem} {priority}* command.

“no” form no log server {<ip address> | <hostname>}
The “no” form of this command deletes the specified log server.

Defaults Not set**Example**

```
BASR(config)# log server 172.16.1.200
```

Related Commands log {destination} {subsystem} {priority} on page 15-13
show log server on page 15-17

```
log {destination} {subsystem} {priority}
```

Summary Initiates system logging of specified messages.**Required Mode** Global Config**User Entered Parameters** *{destination}*

The available log destinations are *buffer* (NVRAM buffer), *console* (console port terminal window), or *network*. When network is the indicated destination, you must specify a syslog server by IP address for logging to be successful.

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System Logging Commands

{subsystem}

The BAS subsystem for which you want messages logged. The available subsystems are:

- *adsl* – ADSL subsystem
- *alarm* – Alarm subsystem
- *cc* – Channel control subsystem
- *cfg* – Configuration subsystem
- *cid* – Caller ID (to STB) subsystem
- *cm* – Call Manager subsystem
- *cool* – Cooling subsystem
- *cps* – Control Plane Services subsystem
- *crash* – Debug/crash subsystem
- *dhcpr* – DHCP Relay subsystem
- *diags* – Diagnostics subsystem
- *dsp* – Voice DSP subsystem
- *em* – Event manager subsystem
- *ems* – Element Management System (BAM) subsystem
- *event* – Event subsystem
- *flash* – Flash driver subsystem
- *gig* – Gigabit Ethernet subsystem
- *heap* – Memory debugging subsystem
- *i2c* – I2C bus device subsystem
- *ifm* – Interface Manager subsystem
- *igmp* – IGMP snooping and multicast subsystem
- *led* – LED control subsystem
- *lockout* – Lock-out security subsystem
- *log* – Event logging services
- *mgcp* – MGCP subsystem
- *panmain* (init) – Messages generated during system initialization
- *pdp* – currently not supported
- *rstp* – Rapid Spanning Tree Protocol subsystem
- *sip* – SIP Application
- *slac* – SLAC Monitor
- *smc* – 10/100 Ethernet port diagnostics subsystem
- *sntpd* – SNTP daemon
- *ssh* – Secure Shell login subsystem
- *system* – system time
- *taskmon* – Task monitor subsystem
- *tdm* – TDM subsystem
- *vxwq* – VX Works message queue



CAUTION: To perform SIP logging, the serial port baud rate must be set to 57600 bps or higher, rather than the default 9600 bps. See “serial baudrate {<baudrate>}” on page 5-2 for information on changing the baud rate. Note that changing the baud rate requires the BAS to be rebooted.

{priority}

The message priority setting indicates the lowest-level priority that is to be logged to the specified destination; for example, specifying a priority of high indicates that both “high” and “highest” priority messages are to be logged to the given destination. Available priorities are *lowest*, *low*, *event*, *medium*, *high*, *highest*, or *all*.



CAUTION: Use the “log” command with caution when specifying “network” as the destination. Indiscriminate use of the command can cause the BAS to become bogged down by excess log traffic.

In general, avoid setting the priority to “lowest”, as that causes the highest amount of log messages to be generated. Most “lowest” level system messages are only intended for use by Pannaway support and are not relevant to customers for troubleshooting purposes.

The subsystems of greatest interest for customer use are the *adsl*, *sip*, *mgcp*, *ems*, *lockout*, *dhcpr*, *igmp*, and *gig* subsystems; other subsystems are generally only of interest to technical support.

We also recommend that you limit the issuing of log messages to the console, as it can affect system performance. If you do log messages to the console, ensure that your console connection is set at the highest baud setting (115,200 bps).

In addition, to avoid impacting customer data, we recommend that you configure any syslog server on a separate management network connected to the front panel 10/100BASE-T Ethernet service port.

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System Logging Commands

Description This command initiates system logging of messages. To configure the BAS to log messages to other destinations than the default NVRAM buffer, use the log command to specify the destination for log messages, the subsystem for which to activate message logging, and the priority of messages to log to that specified destination.

“no” form no log {destination} {subsystem} {priority}
The “no” form of this command halts the specified log output.

Defaults Logs all messages except *lowest* priority to NVRAM.

Example

```
BASR(config)# log network adsl highest
```

Related Commands log server {<ip address> | <hostname>} on page 15-13

show log messages {adsl | alarm | cc | cfg | cid | cm | cool | cps | crash | dhcpr | diags | dsp | em | ems | event | flash | gig | heap | i2c | ifm | igmp | led | lockout | log | mgcp | panmain | pdp | rstp | sip | slac | smsc | snrpd | ssh | systime | taskmon | tdm | vxwq} on page 15-17

log facility {<local0-local7>}

Summary Defines the local facility level for syslog messages issued by the BAS.

Required Mode Global Config

User Entered Parameters <local0-local7>

The locally defined facility level to assign to syslog messages issued by the device: local0, local1, local2, local3, local4, local5, local6, or local7. These correspond to the “local use” facilities of the Syslog protocol, identified by numerical codes 16 (local0) to 23 (local7).

Description This command defines the local facility level for syslog messages issued by the BAS. The facility is intended to be used to provide identifying information about the entity (facility) that issued the message. The facility definition is essentially arbitrary, in that it

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System Logging
Commands

is only meaningful as classified by the system administrator. For example, an administrator could use “local2” as an identifier of Pannaway devices, or as an identifier of access switch devices, or as an identifier of router devices. The definition only has meaning if it is consistently applied across the network for the purposes of filtering syslog messages from, or forwarding them to, the appropriate message destination. You can only specify a single log facility for the BAS.

“no” form no log facility
The “no” form of this command restores the default facility assignment.

Defaults Facility level: local0

Example

```
BASR(config)# log facility local5
```

Related Commands log server {<ip address> | <hostname>} on page 15-13
show log summary on page 15-18

log-monitor enable

Summary While in an active remote (Telnet/SSH) session, enable the console output to be mirrored to the remote session when “log to console” is active.

Required Mode Privileged Exec

User Entered Parameters None

Description This command enables the BAS to mirror the output of console messages when “log to console” has been selected as the log destination. The messages match the subsystem and priority as defined in the “log {destination} {subsystem} {priority}” command.

“no” form no log-monitor enable
The “no” form of this command disables the output of local console messages to the active remote session.

Defaults Disabled

Example

```
BASR# log-monitor enable
BASR# configure log console igmp low
2006-08-09 13:57:01, M_igmp: Igmp query sent, vlan 4061, port 3886
2006-08-09 13:57:01, M_igmp: Igmp query sent, vlan 30, port 3870
2006-08-09 13:57:01, M_igmp: Igmp query sent, vlan 30, port 3877
2006-08-09 13:57:01, M_igmp: Igmp query sent, vlan 30, port 3886
2006-08-09 13:57:13, M_igmp: Igmp query sent, vlan 4061, port 3886
```

Related Commands log {destination} {subsystem} {priority} on page 15-13

```
show log messages {adsl | alarm | cc | cfg | cid | cm | cool | cps | crash | dhcpr | diags | dsp | em |
ems | event | flash | gig | heap | i2c | ifm | igmp | led | lockout | log | mgcp | panmain | pdp | rstp |
sip | slac | smsc | sntpd | ssh | systime | taskmon | tdm | vxwq}
```

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System Logging Commands

Summary Show the contents of the specified system log.

Required Mode Privileged Exec

User Entered Parameters *{adsl / alarm / cc / cfg / cid / cm / cool / cps / crash / dhcpr / diags / dsp / em / ems / event / flash / gig / heap / i2c / ifm / igmp / led / lockout / log / mgcp / panmain / pdp / rstp / sip / slac / smsc / sntpd / ssh / systime / taskmon / tdm / vxwq}*

This selection parameter specifies the type of system log that should be retrieved and displayed in response to the command.

{lowest / low / event / medium / high / highest / all}

This mandatory parameter specifies the lowest priority of log entries or messages from the selected log should be displayed. Messages of the specified priority and higher are displayed. For example, if you specify “medium”, messages of medium, high, and highest priority are displayed. If you specify “lowest”, all messages are displayed.

Description This command retrieves and displays the contents of one of the BAS’s system message logs. Each log message is shown, with a timestamp and any associated message text.

“no” form None

Defaults None

Example

```
10.11.2.5# show log messages rstp low
2005-08-11 10:53:34, M_rstp: RSTP Flush Port's Filter Table Info Event Triggered
2005-08-11 10:53:34, M_rstp: RSTP Disable Learning Event Triggered
2005-08-11 10:53:34, M_rstp: RSTP Disable Forwarding Event Triggered
2005-08-11 10:53:33, M_rstp: RSTP Flush Port's Filter Table Info Event Triggered
2005-08-11 10:53:33, M_rstp: RSTP Enable Forwarding Event Triggered
2005-08-11 10:53:33, M_rstp: RSTP Enable Learning Event Triggered
2005-08-11 10:53:26, M_rstp: RSTP Flush Port's Filter Table Info Event Triggered
2005-08-11 10:53:26, M_rstp: RSTP Disable Learning Event Triggered
2005-08-11 10:53:26, M_rstp: RSTP Disable Forwarding Event Triggered
2005-08-11 10:53:25, M_rstp: RSTP Flush Port's Filter Table Info Event Triggered
2005-08-11 10:53:25, M_rstp: RSTP Enable Learning Event Triggered
2005-08-11 10:52:34, M_rstp: RSTP Enable Forwarding Event Triggered
2005-08-11 10:52:34, M_rstp: RSTP Enable Learning Event Triggered
```

```
show log server
```

Summary Show the IP address of the BAS log server.

Required Mode Privileged Exec

User Entered Parameters None

Description This command displays the IP address that has been assigned to the system log server. If no log server has been set, this command will return an error message.

"no" form None**Defaults** None**Example**

BASR# show log server

172.16.1.187

Related Commands log server {<ip address> | <hostname>} on page 15-13

show log summary

Summary Show the current state of the BAS system log.**Required Mode** Privileged Exec**User Entered
Parameters** None

Description This command displays a table of the logging groups of the BAS and the currently active log destinations for those groups by priority level. A logging group's destination can be the system buffer, the console interface, or the network/system log server address.

These destinations are abbreviated in the log summary table:

- b = buffer
- c = console
- n = network or system log server

"no" form None**Defaults** None

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System Logging Commands

Example

```
10.11.2.7# show log summary
log server: 172.16.1.99
log facility: local2 [18]
```

	lowest	low	event	medium	high	highest
diags		b	b	b	b	b
log		b	b	b	b	b
adsl		b	b	b	b	b
panmain		b	b	b	b	b
vxwq		b	b	b	b	b
em		b	b	b	b	b
cps		b	b	b	b	b
gig		b	b	b	b	b
sip		b	b	b	b	b
slac		b	b	b	b	b
cc		b	b	b	b	b
ifm		b	b	b	b	b
cm		b	b	b	b	b
flash		b	b	b	b	b
systime		b	b	b	b	b
crash		b	b	b	b	b
sntpd		b	b	b	b	b
dsp		b	b	b	b	b
tdm		b	b	b	b	b
igmp		b	bc	bc	bc	bc
i2c		b	b	b	b	b
taskmon		b	b	b	b	b
cool		b	b	b	b	b
ssh		b	b	b	b	b
cfg		b	b	b	b	b
smc		b	b	b	b	b
rstp		b	bc	bc	bc	bc
led		b	b	b	b	b
alarm		b	b	b	b	b
event		b	b	b	b	b
pdp		b	b	b	b	b
mgcp		b	b	b	b	b
heap		b	b	b	b	b
cid		b	b	b	b	b
ems		b	b	b	b	b
dhcpr		b	b	b	b	b
lockout		b	b	b	b	b

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Commands*

Related Commands log {destination} {subsystem} {priority} on page 15-13

15.6 Diagnostic File Commands

These commands are used to manage the diagnostic files that can be used by Pannaway's Technical Support personnel to troubleshoot isolated system crashes.

15.6

Diagnostic File Commands

clear crash-files

Summary Erase system crash files from memory.

Required Mode Privileged Exec

User Entered Parameters None

Description This command erases any crash files stored in BAS system memory. These crash files are automatically saved to FLASH memory by the BAS in the event of a system crash or unrecoverable error. Technical Support personnel can examine these files to diagnose BAS operational problems. A prompt appears to confirm this command action before the crash files are erased.



NOTE: Crash files are useful to support personnel only. Crash files are stored in a raw binary format that is unreadable by standard text editors.

The BAS can store up to 30 crash files before old files are overwritten.

"no" form None

Defaults None

Example

```
BASR# clear crash-files
```

Related Commands copy crash-files {<url>} on page 15-20

copy crash-files {<url>}

Summary Save crash files to a remote FTP server.

Required Mode Privileged Exec

User Entered Parameters **<url>**

The uniform resource locator of a File Transfer Protocol (FTP) directory on a server connected to the BAS's network interfaces. The URL supplied must include the full directory path relative to the root level of the FTP server.

Description This command copies the crash files stored in the BAS FLASH memory to a specified FTP server. Technical Support personnel can examine these files to diagnose BAS operational problems.



NOTE: Crash files are useful to support personnel only. Crash files are stored in a raw binary format that is unreadable by standard text editors.

The BAS can retain up to 30 crash files in memory. Each crash file that is saved to the FTP server will be assigned the name CRASH_FILE.NN, where “NN” is a number from 01 - 30. If a crash file already exists at the location specified by the URL parameter, the existing file is retained and a “could not create file” error message is generated.

“no” form None

Defaults None

Example

```
BASR# copy crash-files ftp://anonymous:guest@172.16.1.187/uploads/CF/
```

Related Commands clear crash-files on page 15-20

15.7 ADSL Loopback Tests

The following tests place the ADSL hardware in loopback mode at various locations within the transmission path. These hardware debug tests check the integrity of the BAS’s internal hardware. They are intended for use and interpretation by experienced service technicians, and should not be used for general troubleshooting.



NOTE: These ADSL commands do not apply to the BAS-POTS48R device.

debug adsl analog loopback

Summary Place all ADSL ports in analog loopback mode.

Required Mode Privileged Exec

User Entered Parameters None

Description This command sets *all* ADSL ports on the BAS into an analog loopback state. This loops back the ADSL signal at the analog interface, enabling service technicians to test the BAS’s analog signal generation properties.

A single ADSL port can be put into analog loopback state by using the appropriate ADSL interface configuration command.



CAUTION: Looping back the ADSL ports of the BAS interrupts service to all downstream CPE gear, and should only be performed by authorized technicians as part of a service or troubleshooting operation.

“no” form no debug adsl
The “no” format of this command clears any administratively set loopback states from the ADSL ports of the BAS.

Defaults None

15.7

ADSL Loopback Tests

Example

```
BASR# debug adsl analog loopback
```

```
ADSL analog loopback enabled for all ports.
```

Related Commands `adslinetable adsllineconfaction {abort | startup | shutdown | analog_lb | atm_lb | digital_lb | c_reverb | c_medley | c_pilot | atuc_mtpr | atur_mtpr}` on page 6-80

debug adsl atm loopback

Summary Set all ADSL ports to ATM loopback mode.

Required Mode Privileged Exec

User Entered Parameters None

Description This command places *all* of the ADSL ports of the BAS into an ATM loopback state. This loopback capability is used to test the operation of the BAS's ADSL ports.

A single ADSL port can be put into an ATM loopback state by using the appropriate ADSL interface configuration command.



CAUTION: Looping back the ADSL ports of the BAS interrupts service to all downstream CPE gear, and should only be performed by authorized technicians as part of a service or troubleshooting operation.

“no” form `no debug adsl`
The “no” format of this command clears any administratively set loopback states from the ADSL ports of the BAS.

Defaults None

Example

```
BASR# debug adsl atm loopback
```

```
ADSL ATM loopback enabled for all ports.
```

Related Commands `adslinetable adsllineconfaction {abort | startup | shutdown | analog_lb | atm_lb | digital_lb | c_reverb | c_medley | c_pilot | atuc_mtpr | atur_mtpr}` on page 6-80

debug adsl digital loopback

Summary Loop back all ADSL ports at the digital framer interface.

Required Mode Privileged Exec

User Entered Parameters None

Description This command sets *all* ADSL ports on the BAS into a digital loopback state. This loops back the ADSL signal at the ADSL framing interface, enabling service technicians to check the operation of the hardware components that pass signals to the ADSL framing systems of the BAS.

A single ADSL port can be put into a digital loopback state by using the appropriate ADSL interface configuration command.



CAUTION: Looping back the ADSL ports of the BAS interrupts service to all downstream CPE gear, and should only be performed by authorized technicians as part of a service or troubleshooting operation.

“no” form no debug adsl

The “no” format of this command clears any administratively set loopback states from the ADSL ports of the BAS.

Defaults None

Example

```
BASR# debug adsl digital loopback
ADSL digital loopback enabled for all ports.
```

Related Commands adslinetable adsllineconfaction {abort | startup | shutdown | analog_lb | atm_lb | digital_lb | c_reverb | c_medley | c_pilot | atuc_mtpr | atur_mtpr} on page 6-80

15.8 ADSL Line Tests

The BAS provides two types of ADSL line diagnostics: dual-ended line testing (DELT) and single-ended line testing (SELT).



NOTE: These ADSL commands do not apply to the BAS-POTS48R device.

About DELT

DELT, also known as loop diagnostics mode, is an ITU-T G.992.3 (ADSL2)/G.992.5 (ADSL2+) standard test for ADSL lines. DELT can debug possible issues with the physical loop (for example, when line quality is too poor to reach DATA mode) and check for adequate physical media performance margin at acceptance and after repair verification.

If an ADSL line can't achieve DATA mode, you can use DELT to troubleshoot the problem. DELT immediately measures line conditions at both ends of the line without requiring on-site personnel to attach test equipment to the line. The test results help to isolate the location (inside the premises, near the customer end of the line, or near the network end of the line) and the sources (crosstalk, radio frequency interference, and bridged tap) of impairments.

15.8

ADSL Line
Tests**Running DELT Tests**

To run a DELT test, you issue a command to initiate DELT mode on a specified port. The DELT test runs for a short period (going through the Handshake, Channel Discovery, Transceiver Training, and Channel Analysis states), and then halts after performing the loop diagnostics portion of the Exchange state.

At this point, you can use a CLI show command to display the test results. The results are stored until the port is transitioned to some other mode than DELT.

Currently, you can only remove a port from DELT mode by using the “no” form of the command. This places the port in idle state, from which it can be started in the desired mode.



NOTE: DELT is only available for ports that have been previously started-up in ADSL2 mode, and DELT must be supported by both the near end (ATU-C) and far end (ATU-R) of the connection.

In addition, DELT can only be initiated from one side of the connection. Although the far-end equipment may support DELT, Pannaway recommends that you start DELT from the ATU-C (BAS) side of the connection.

If a port is currently in service, we recommend that you take the port out of service (that is, put it in idle mode) by using the “no” version of the start command. See page 6-88 for instructions on how to do this.

Once the port is in idle state, you can successfully run the test and view results. After viewing the results, you should exit DELT mode, and then re-start the port for normal operational mode if necessary. If you fail to take the port out of DELT mode after finishing the test, the ADSL port state will be misleading the next time that you reboot the BAS.

```
del [adsl2plus | adsl2]
```

Summary Performs a DELT test on a specified ADSL line.

Required Mode Interface Config

User Entered Parameters ***adsl2plus / adsl2***

Determines whether to initiate the test in ADSL2+ mode or ADSL2 mode. If neither is specified, the test defaults to starting in ADSL2+ mode. The difference between the two modes of operation is the length of eight DELT-related per bin statuses, as shown in the table below.

Table 15-1. DELT Statistics Dependent Upon Mode of Operation

MIB Parameter Name	ADSL2 Mode Length	ADSL2+ Mode Length
adslAtucDeltHLINpsus	64 word array	64 word array
adslAtucDeltHLOGpsus	32 word array	32 word array
adslAtucDeltQLNpsus	32 byte array	32 byte array
adslAtucDMTBinSNR	32 byte array	32 byte array
adslAturDeltHLINpsds	512 word array	1024 word array
adslAturDeltHLOGpsds	256 word array	512 word array
adslAturDeltQLNpsds	256 byte array	512 byte array
adslAturDMTBinSNR	256 byte array	512 byte array

Description This command initiates DELT on an ADSL line.

“no” form no delt

Defaults None

Example

```
BASR(config if)# delt adsl2
```

Related Commands show interface adsl {<port>} delt [verbose] on page 15-25

```
show interface adsl {<port>} delt [verbose]
```

Summary Show the results of a DELT test.

Required Mode Privileged Exec

User Entered *verbose*

Parameters This optional parameter specifies that detailed information be included in the output, such as Channel Characteristics Function per sub-carrier, Quiet Line Noise PSD, QLN per sub-carrier, and Signal-to-Noise ratio per sub-carrier.



TIP: Currently the detailed output that is produced by specifying the verbose option is presented in raw data (hexadecimal) format. For the current release of the BAS, there is no useful means to interpret this data; however, Pannaway will provide a utility for extracting useful information from the data in the near future.

Description This command displays signal and line attenuation rates for both the far end and near end of the line, output power, theoretical attainable rates, current signal-to-noise ratio information, and last known transmit state. If the verbose option is used, detailed information is provided for each transmit bin

“no” form None

Defaults None

15.8

ADSL Line
Tests

Example

```

BASR(config)# show interface adsl 11 delt verbose
Dual-Ended Line Test (DELT) Results (Port 11):
      ATU-C      ATU-R
      near-end    far-end
      -----
Current Attenuation:      0.0dB      0.0dB
Signal Attenuation:      102.3dB     102.3dB
Current Attainable Rate: 10420000bps 1212000bps

Other values:
ATU-C CurrSnrMgn:  -51.2dB
      CurrOutputPwr: 0.0dB
      LastTxState:  C_Showtime (0x20)
ATU-R CurrSnrMgn:  -51.2dB
      CurrOutputPwr: 0.0dB
      LastTxState:  R_Showtime (0x1F)

----- Note: Sample output below is only displayed with verbose option -----

ATU-C SNRMTus:      4000
      DMTBinSNR:    000: 40 40 40 40 40 40 77 85 8D 93 96 9A A0 A2 A5 A5
                        016: A7 A7 A8 A8 A7 A7 A3 A3 9F 9D 9A 94 8F 86 81 7B
      QLNMTus:      4000
      QLNpsus:      000: 63 84 83 80 7A 59 7C 7E 7E 7A 6D 78 78 78 75 72
                        016: 43 43 43 37 37 37 37 37 2B 2B 2B 2B 2B 1F 1F 1F
      HLINSCus:     16383
      HLINpsus:     000: FF FF FF FF 00 00 FF FD 00 00 FF FE 00 00 FF FF
                        016: FF FF FF FF FF FF 00 00 F8 20 FB E0 08 40 F2 C0
                        -- sample output cut --
                        096: 1A C0 19 3F DF 80 12 80 08 88 23 77 FF B2 22 01
                        112: 07 7F E3 7F 0A EA EB 69 F4 16 0C 96 05 B2 0B 4D
      HLOGMTus:     4000
      HLOGpsus:     000: 01 5B 01 C1 01 E7 02 3C 02 3D 02 47 00 A0 00 88
                        016: 00 78 00 6C 00 65 00 61 00 5E 00 5C 00 5B 00 59
                        032: 00 58 00 58 00 59 00 5A 00 5D 00 60 00 62 00 63
                        048: 00 63 00 62 00 63 00 66 00 6C 00 77 00 84 00 91
ATU-R SNRMTds:      4000
      DMTBinSNR:    000: 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40
                        016: 40 40 40 40 40 40 40 40 40 40 40 41 43 47 4B 4E
                        -- sample output cut --
                        224: 9A 9B 9B 9B 9A 9B 9C 9B 9B 9B 9B 9B 9A 9B 9A 9B
                        240: 9A 9A 9A 9A 9A 9A 9A 9A 9A 99 99 99 9A 9A 99 9A
      QLNMTds:      4000
      QLNpsds:      000: 7F C8 C8 C7 C8 C7 C7 C8 C7 C7 C7 C7 C7 C5 C7
                        016: C7 C7 C7 C6 C7 C7 C6 C6 C6 C6 C5 C5 C5 C4 C3
                        -- sample output cut --
                        224: 89 88 88 87 89 89 88 86 86 85 86 87 86 86 86 86
                        240: 86 87 86 83 85 84 85 85 85 85 83 84 82 83 83 81
      HLINSCds:     4095
      HLINpsds:     000: FF FF FF FF 00 00 FF FF 00 00 FF FF 00 00 FF FF
                        016: FF FF 00 01 FF FF FF FF 00 00 FF FF 00 01 00 00
                        -- sample output cut --
                        992: 2B 0E 10 09 2D E7 06 F6 2E 86 FD 78 2D 48 F3 E3
                        1008: 2A 27 EA D7 25 1C E2 E1 1E AF DB 4F 16 55 D5 AD
      HLOGMTds:     4000
      HLOGpsds:     000: 00 CE 02 44 02 4C 02 49 02 29 02 33 02 41 02 1E
                        016: 02 25 02 21 02 5D 02 3F 02 97 02 53 02 1C 02 1B
                        -- sample output cut --
                        480: 00 98 00 98 00 97 00 97 00 96 00 96 00 96 00 96
                        496: 00 95 00 95 00 95 00 94 00 94 00 94 00 94 00 94

```

Command Output The following information is displayed for both the near-end (ATU-C) and far-end (ATU-R) of the connection, when the command is run both in normal mode and with the verbose option:

Current Attenuation	<p>ATU-C (upstream line attenuation) – The measured difference in dB in the total power transmitted by the ATU-R and the total power received by the ATU-C over all sub-carriers (bins) during diagnostics mode and initialization.</p> <p>ATU-R (downstream line attenuation) – The measured difference in dB in the total power transmitted by the ATU-C and the total power received by the ATU-R over all sub-carriers (bins) during diagnostics mode and initialization.</p> <p>Both upstream and downstream line attenuation have a granularity of 0.1 dB, and a range of 0 to 102.2 db. If this field displays 102.3 db, it indicates that the loop attenuation is out of range to be represented.</p>
Signal Attenuation	<p>ATU-C (upstream signal attenuation) – The measured difference in dB in the total power transmitted by the ATU-R and the total power received by the ATU-C over all sub-carriers (bins), with the received signal power fine-tuned to estimate the signal power that will be received during showtime, so signal attenuation may be significantly lower than the line attenuation.</p> <p>ATU-R (downstream signal attenuation) – The measured difference in dB in the total power transmitted by the ATU-C and the total power received by the ATU-R over all sub-carriers (bins), with the received signal power fine-tuned to estimate the signal power that will be received during showtime, so signal attenuation may be significantly lower than the line attenuation.</p> <p>Both upstream and downstream signal attenuation have a granularity of 0.1 dB, and a range of 0 to 102.2 db. If this field displays 102.3 db, it indicates that the signal attenuation is out of range to be represented.</p>
Current Attainable Rate	<p>These fields indicate the maximum current attainable net data rate, accounting for the loop characteristics at the instant of measurement. Attainable data rate is calculated from current SNR values, assuming integer bit loading, without coding gain.</p> <p>ATU-C – The maximum upstream net data rate, in bits/s, currently attainable by the ATU-R transmitter and the ATU-C receiver.</p> <p>ATU-R – The maximum downstream net data rate, in bits/s, currently attainable by the ATU-C transmitter and the ATU-R receiver.</p>
CurrentSnrMgn	<p>The current Noise Margin as seen by the ATU-C or ATU-R with respect to its received signal in 0.1 dB increments (negative values are possible).</p> <p>Signal-to-Noise ratio margin represents the amount of increased received noise (in dB) relative to the noise power that the system is designed to tolerate and still meet the target BER of 10⁻⁷, accounting for all coding gains included in the design. The SNR margin ranges from -64 dB to +63 dB with 0.1 dB steps.</p>
CurrOutputPwr	The measured total output power (in dBm) transmitted by the ATU-C or ATU-R, as reported during its last activation sequence.
LastTxState	The last transmitted state in both upstream and downstream directions during the last previous full initialization (start-up attempt) on the line, prior to DELT diagnostics being activated.

15.8

ADSL Line Tests

If the “verbose” detail option is specified, the following is returned for the near-end ATU-C side of the connection. Note that the verbose option currently produces raw data as output.

15.8

ADSL Line Tests

SNRMTus	Signal-to-Noise-Ratio Measurement Time (Upstream) – The number of symbols used to measure the upstream SNR(f) value. Since G.992.3 specifies that the SNR is measured over a 1 second time period in diagnostics mode, the number of symbols is typically 4000.
DMTBinSNR	DMT Bin Signal-to-Noise Ratio – Displays an array of real upstream SNR(f) values per sub-carrier (bin) in hex format.
QLNMTus	Quiet Line Noise Measurement Time (Upstream) – The number of symbols used to generate the upstream QLN(f) value. Since G.992.3 specifies that the QLN is measured over a 1 second time period in diagnostics mode, the number of symbols is typically 4000.
QLNpsus	Quiet Line Noise PSD (Upstream) – The root mean square (rms) level of the noise present on the line, when no ADSL signals are present on the line.
HLINSCus	Channel Characteristics (Linear) scale factor – The scale factor (multiplier) to be applied to the upstream Hlin(f) values.
HLINpsus	H(f) Linear Representation (Upstream) – An array of complex downstream Hlin(f) values in linear scale that can be used to determine channel characteristics.
HLOGMTus	H(f) Logarithmic Measurement Time (Upstream) – The number of symbols used to generate the H(f) logarithmic array. Since G.992.3 specifies that Hlin(f) and Hlog(f) are measured over a 1 second time period in diagnostics mode, the number of symbols is typically 4000.
HLOGpsus	H(f) Logarithmic Representation (Upstream) – An array of complex upstream Hlin(f) values in logarithmic scale that can be used to determine channel characteristics.

If the “verbose” detail option is specified, the following is returned for the far-end ATU-R side of the connection. Note that the verbose option currently produces raw data as output.

SNRMTds	Signal-to-Noise-Ratio Measurement Time (Downstream) – The number of symbols used to measure the downstream SNR(f) value. Since G.992.3 specifies that the SNR is measured over a 1 second time period in diagnostics mode, the number of symbols is typically 4000.
DMTBinSNR	DMT Bin Signal-to-Noise Ratio – Displays an array of real downstream SNR(f) values per sub-carrier (bin) in hex format.
QLNMTds	Quiet Line Noise Measurement Time (Upstream) – The number of symbols used to generate the downstream QLN(f) value. Since G.992.3 specifies that the QLN is measured over a 1 second time period in diagnostics mode, the number of symbols is typically 4000.
QLNpsds	Quiet Line Noise PSD (Downstream) – The root mean square (rms) level of the noise present on the line, when no ADSL signals are present on the line.
HLINSCds	Channel Characteristics (linear) scale factor – The scale factor (multiplier) to be applied to the downstream Hlin(f) values.
HLINpsds	H(f) Linear Representation (downstream) – An array of complex downstream Hlin(f) values in linear scale that can be used to determine channel characteristics.

HLOGMTds	H(f) Logarithmic Measurement Time (Upstream) – The number of symbols used to generate the H(f) logarithmic array. Since G.992.3 specifies that Hlin(f) and Hlog(f) are measured over a 1 second time period in diagnostics mode, the number of symbols is typically 4000.
HLOGpsds	H(f) Logarithmic Representation (upstream) – An array of complex downstream Hlin(f) values in logarithmic scale that can be used to determine channel characteristics.

Related Commands `delt [adsl2plus | adsl2]` on page 15-24

About SELT

SELT is a proprietary ADSL line diagnostics test, supported by several ADSL vendors, that has been submitted for ITU-T consideration as a new G.selt standard. The BAS SELT tests perform a reflective line measurement on a single-ended loop topology, and the BAS's internal processor calculates test results. SELT can be used to:

- Characterize/test the loop before activating the line for service, including measuring the loop length, determining wire gauge, and providing pre-service capacity measurements.
- Run post-service tests when line failures occur, including the detection of opens or shorts on the line.

selt

Summary Performs a SELT test on a specified ADSL line.



CAUTION: SELT must only be performed on one line at a time within a particular cable binder. Although the SELT test is computation-intensive, it is designated as low priority to the BAS network processor and can require several minutes to complete. Interrupting a test in progress invalidates the test, and no results are returned.

SELT processing does not impact service on adjacent ADSL ports.

For safety, we suggest that you only perform a single SELT test at a time in the complete network.

Required Mode Interface Config

User Entered Parameters None

Description This command initiates SELT on an ADSL line.

“no” form `no selt`

Defaults None

Example

```
BASR(config if)# selt
```

Related Commands `show interface adsl {<port>} selt [verbose]` on page 15-30

```
show interface adsl {<port>} selt [verbose]
```

15.8

ADSL Line Tests

Summary Show the results of a SELT test.

Required Mode Privileged Exec

User Entered Parameters *verbose*

This optional parameter specifies that detailed information be included in the output, such as Channel Characteristics Function per sub-carrier, Quiet Line Noise PSD, QLN per sub-carrier, and Signal-to-Noise ratio per sub-carrier.



TIP: Currently the detailed output that is produced by specifying the verbose option is presented in raw data (hexadecimal) format. For the current release of the BAS, there is no useful means to interpret this data without using Pannaway's BAM.

Description This command displays signal and line attenuation rates for both the far end and near end of the line, output power, theoretical attainable rates, current signal-to-noise ratio information, and last known transmit state. If the verbose option is used, detailed information is provided for each transmit bin

"no" form None

Defaults None

Example

```
BASR(config)# show interface adsl 24 selt verbose
Single-Ended Line Test (SELT) Results:
Port 24
Loop Length:          297ft
Loop Termination:     OPEN
Loop Gauge:           26AWG
Upstream Shannon Capacity: 1000bps
Downstream Shannon Capacity: 9000bps

----- Note: Sample output below is only displayed with verbose option -----

Inband Noise:          000: FF FF FC 6B FF FF FB 6D FF FF FB 62 FF FF FB 51
                       016: FF FF FB 46 FF FF FB 38 FF FF FB 2F FF FF FB 2C
                       -- sample output cut --
                       992: FF FF FB 11 FF FF FB 28 FF FF FB 2F FF FF FB 2C
                       1008: FF FF FB 21 FF FF FB 3C FF FF FB 33 FF FF FB 3B
Termination Response: 000: 00 00 00 2C 00 00 00 2B 00 00 00 20 00 00 00 0C
                       016: FF FF FF EE FF FF FF D0 FF FF FF B9 FF FF FF AA
                       -- sample output cut --
                       688: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                       704: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Upstream Mgn At Rate: 000: 00 00 02 C6 00 00 02 B2 00 00 02 9E 00 00 02 8A
                       016: 00 00 02 6C 00 00 02 58 00 00 02 3A 00 00 02 26
                       -- sample output cut --
                       576: FF FF F8 F8 FF FF F8 F8 FF FF F8 F8 FF FF F8 F8
                       592: FF FF F8 F8 FF FF F8 F8
Downstream Mgn At Rate: 000: 00 00 02 BC 00 00 02 BC 00 00 02 B2 00 00 02 B2
                       016: 00 00 02 A8 00 00 02 A8 00 00 02 9E 00 00 02 9E
                       -- sample output cut --
                       576: FF FF F8 F8 FF FF F8 F8 FF FF F8 F8 FF FF F8 F8
                       592: FF FF F8 F8 FF FF F8 F8
```


Command Output The following information is displayed when the SELT command is run both in normal mode and with the verbose option:

Loop length	The length of the local loop (in feet)
Loop Termination	Indicates whether the loop is an open or short circuit. Note that the only valid use for the Loop Termination test is as a pre-deployment test. Single ended loop testing only provides accurate information if the remote side is un-terminated (open or short). If the loop is off hook, terminated with a DSL modem or if there are microfilters or inline splitters present, the results will be invalid.
Loop Gauge	The gauge of wire used for the loop, in AWG. Possible values are 26 AWG, 24 AWG, or unknown AWG.
Upstream Shannon Capacity	The theoretical maximum rate (in bps) in the upstream direction under ideal, unimpaired conditions (no noise, no attenuation, and so forth).
Downstream Shannon Capacity	The theoretical maximum rate (in bps) in the downstream direction under ideal, unimpaired conditions (no noise, no attenuation, and so forth).

If the “verbose” detail option is specified, the following is returned when you run the SELT command. Note that the verbose option currently produces raw data as output.

Inband Noise	Aggregate disturber information. 256 values that indicate inband noise in dBm/Hz, covering both bands, are provided from 0 to 1.1 MHz.
Termination Response	180 values that indicate termination response magnitude are provided, from 0 to 18 kft. The maximum, or peak, value corresponds to loop length or the location of the first open/short.
Upstream Mgn At Rate	150 values that indicate the upstream SNR margin in dB/10 at a particular rate are provided, from 0 to 15 Mbps
Downstream Mgn At Rate	150 values that indicate the downstream SNR margin in dB/10 at a particular rate are provided, from 0 to 15 Mbps

Related Commands `selt` on page 15-29

15.9 Metallic Test Access Ports Commands

The BAS-POTS48R provides a Test Access Port (TAP) to allow for built-in metallic test access (in both directions). By breaking the POTS port between the line circuit access switch (LCAS) and the protection circuit, the TAP interface has the capability to test the Facility (copper pairs to customer premise) and the Equipment (from the onboard SLIC through the voice gateway to the CO switch).

Test Access is provided at two locations on the BAS.

- On the rear of the chassis, a set of four terminal blocks allows for permanent connection to a rack mounted test head.
- On the front of the chassis, a pair of mini-bantam jacks allow for connection to a mobile test head. When a test jack is inserted into the mini-bantam, the rear terminal blocks are disconnected from the test bus. This allows a technician to test with a mobile test head without disconnecting a permanent test head.

15.9

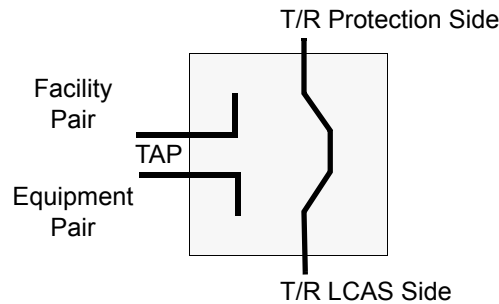
Metallic Test Access Ports Commands

15.9

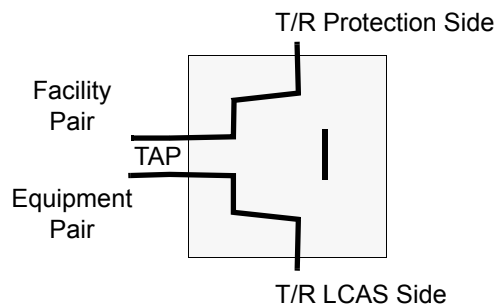
Metallic Test
Access Ports
Commands**Test Access Port
States**

There are five Test Access Port states that can be configured through management, as described in the following sections:

Released When the Test Access Port is in Released mode, no POTS ports are connected to the test bus and the test interface is completely isolated. The Test Access Port is set to released state upon BAS reboot, to avoid an unintentional entry into test state on device boot-up.

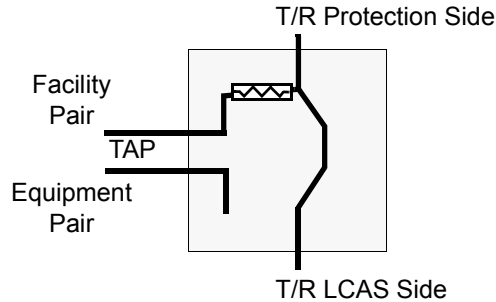


Split In the Split test mode, a line can be tested out to the customer premise and back toward the BAS. Some test heads can connect the Facility pair and the Equipment pair internally and can also monitor voice conversations in this configuration. In this mode, a pair of relays breaks the connection between the LCAS and the protection circuitry for that port. The relay on the line circuit access switch side connects the LCAS Tip and Ring to the Equipment test bus. The relay on the protection side connects the protection Tip and Ring to the Facility test bus.

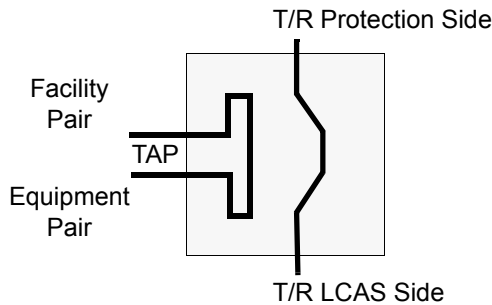


Monitor The Monitor test mode was designed specifically for mobile test heads that do not have built-in monitor support. This mode allows a mobile test head, equipped with a high impedance monitor IC that does not load the Tip/Ring pair, to monitor a voice conversation without effecting voice performance. In this mode, a pair of relays connects the Tip and Ring to the Facility Pair test bus via 400 ohm current limit resistors. The Equipment Pair test bus is disconnected.

15.9

Metallic Test
Access Ports
Commands

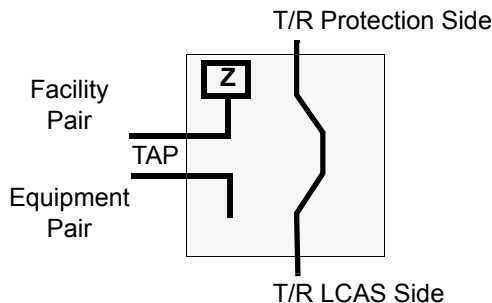
Loop Around The Loop Around test mode is used to test the Tip and Ring pairs between the test head and the Test Access Port. This is simply a loopback to the test head.



Distinctive Termination The Distinctive Termination test mode is also used to test the connection between the test head and the Test Access Port. This mode places a known termination on the Facility pair of the test access port to aid in detecting shorts and opens in the Facility. In this mode the Equipment test pair is unused on the Test Access Port.

The known termination is actually two unidirectional terminations:

- When a forward voltage is applied (Ring more positive than Tip) the impedance will be 300 k (kilo-ohms).
- When a reverse voltage is applied (Tip more positive than Ring) the impedance will be 12 M (mega-ohms).



Test Access Port Command

The following command is used to set the Test Access Port state into a non-testing isolated state, or used to enable self-testing for the connection between the test-head/mobile test unit and the TAP:

```
tap { distinctive-termination | released | loop-around | split <port> | monitor <port> }
```

15.9

Metallic Test Access Ports Commands

Summary Sets the port into the appropriate state for use with metallic test access, as described previously in “Test Access Port States” on page 15-32.

Required Mode Privileged Exec

User Entered Parameters *distinctive-termination*
Configures the Test Access Port with a known termination for self-test between the test head and the TAP.

released

Sets the Test Access Port to an isolated state so that no self-testing or line-testing can be performed. This is the default state of the TAP upon boot-up.

loop-around

Sets the Test Access Port into a loopback state for self-testing of the connection between the test head and the TAP.

split

Sets the port into Split test mode for line testing to the customer premise. A relay connects the line circuit access switch side to the Equipment test bus tip/ring, and a relay on the protection side connects to the Facility test bus tip/ring.

monitor

Sets the port into Monitor test mode for line testing from a mobile test head to the customer premise. A relay connects the line circuit access switch side to the Equipment test bus tip/ring, and a relay on the protection side connects to the Facility test bus tip/ring. In addition, a high impedance monitor IC that does not load the Tip/Ring pair is activated, so that the mobile test head can monitor a voice conversation without voice performance being affected.

<port>

The POTS port associated with the copper line to be tested when the TAP is in split or monitor state.

Description This command sets the Test Access Port to the appropriate state for metallic test access when a test head is connected to the front (mobile test head) or rear (rack mounted test head). States include released (no test – isolated state), distinctive-termination or loop-around for self-testing of the test head and connection, or split or monitor for metallic testing of the local loop.



NOTE: Each time that this command is executed, the previous state of the TAP is overridden with the new configuration.

The TAP state is not written to the system configuration file, to prevent an unintentional TAP state on reboot. Upon reboot the TAP state is always set to released.

“no” form None

Defaults None

Example

```
BASR# tap monitor 15
```

Related Commands None

15.9

*Metallic Test
Access Ports
Commands*

15.9

*Metallic Test
Access Ports
Commands*



Chapter 16

Alarm and Event Monitoring

The following commands can be used to view and manage the alarm and event monitoring subsystems supported by the BAS.

16.1 Contents of this Chapter

The following topics are discussed in this chapter:

Topic	on page
BAS Alarms and Events Overview	16-1
Alarms and Events Configuration Commands	16-2
Alarms and Events Show Commands	16-4
Alarm Lead Configuration Commands	16-6
Alarm and Event Reference	16-10

16.2 BAS Alarms and Events Overview

Alarms describe equipment failures and incoming signal degradation or failures that have been detected on the monitored BAS. Alarm notifications have both a raised or “set” state and a “cleared” state; that is, they indicate faults which have a corresponding resolution condition. In addition, alarms are categorized as “service affecting” and “non-service affecting”. Alarms that are service affecting should be investigated immediately.

The BAS stores alarms in a circular database: the Alarms log. This log can store up to 250 entries before overwriting the oldest entries with the most recent entries. When an alarm generating condition occurs, a “SET” alarm entry is written to the log. When that condition is cleared by the system, a corresponding “CLR” alarm entry is written to the log. The BAS provides commands to view and delete the entries in this Alarms log.

To track raised alarms, the BAS also uses an alarm state table. The state table maintains the current SET state of every possible alarm type at every possible alarm location on the BAS. This alarm state table is *not* persistent across reboots. When the BAS boots up, all entries in the alarm state table are in an unmarked condition. When an alarm generating condition occurs, it is flagged in the alarm state table as SET (as well as written to the Alarms log). If the alarm is resolved (cleared), its SET entry in the state table is reset to unmarked. The BAS provides a command to read the contents of the state table so that you can view all currently SET alarms that have not been resolved.

16.3

Alarms and Events Configuration Commands

Events notify the user of transient conditions experienced by the BAS or its supported sub-systems. Unlike alarms, events are not “state” driven messages which reflect the raising and clearing of a network condition, but instead reflect some transient condition that is of most interest at the time of its occurrence.

Events are stored in an Events log database on the BAS. As with the Alarm log, this database is a circular buffer that can store up to 250 messages. The BAS provides commands to view and delete the entries in this Events log; however, since there is no state associated with an event condition, there is no command to view “unresolved” events.

Both the Alarms and the Events logs are stored in the BAS’s non-volatile memory, so log entries are persistent across reboots of the device.

The 2.2 release of BAS provides functionality to configure operation of the alarm lead connectors on 48-port BAS devices. The alarm leads can be configured for either input (external state change detection) or output (internal BAS alarm) operation, and particular alarm conditions can be associated with output alarms.

16.3 Alarms and Events Configuration Commands

The following command is used to activate alarm and event logging:

```
configure alarm-display enable
```

Summary Enables or disables the automatic display of alarm/event messages to the connected console as they occur.

Required Mode Global Config

User Entered Parameters None

Description This command activates or de-activates the automatic display of alarm and event messages on a locally connected terminal (via the Console port). If automatic display is enabled (the default), the console user is immediately alerted to alarm or event conditions that occur on the BAS. If automatic display is disabled via the “no” form of the command, the user must perform the “show alarms” and “show alarm-log/show event-log” commands to view logged alarms or events.

“no” form no configure alarm-display enable

Defaults Enabled

Example

```
BASR# configure alarm-display enable
```

Related Commands None

clear alarm-log

Summary Deletes all entries in the Alarms log.

Required Mode Global Config

User Entered Parameters None

Description This command deletes all entries currently in the Alarms log. Note that although this removes all entries from the alarm log, it does not effect the current condition of alarm state table. You can still view raised alarms by means of the “show-alarms” command.

“no” form None

Defaults Enabled

Example

```
BASR# clear alarm-log
```

Related Commands show alarm-log [oldest-first] on page 16-4

clear event-log

Summary Deletes all entries in the Events log.

Required Mode Global Config

User Entered Parameters None

Description This command deletes all entries currently in the Events log.

“no” form None

Defaults Enabled

Example

```
BASR# clear event-log
```

Related Commands show event-log [oldest-first] on page 16-5

16.3

Alarms and
Events
Configuration
Commands

16.4 Alarms and Events Show Commands

The following commands are used to display the contents of the Alarms and Events logs and to display active alarms.

16.4

Alarms and Events Show Commands

show alarms

Summary Displays all currently raised (non-cleared) alarms.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays all raised, but unresolved, alarm conditions as read from the alarm state table. Alarms are identified by hexadecimal timestamp, type (ALM), state (SET), severity level, and location on the chassis.

Example

```
BASR# show alarms
2005-08-09 15:36:28, ALM, SET, MIN, Voltage low, port 2
```

Command Output A display of currently raised alarms.

Timestamp	The timestamp associated with the message in YYYY-MM-DD HH:MM:SS format. This timestamp reflects the time at which the alarm occurred (based upon the system clock setting), not the time at which the alarm was displayed.
Type	This always indicates ALM (Alarm).
State	This always indicates SET.
Severity	Minor (MIN), Major (MAJ), or Critical (CRI).
Description	A brief textual description of the alarm; for example "Gigabit LOS" indicates Loss of Signal on the associated gigabit Ethernet port. Refer to "BAS Alarms" on page 16-10 for information on currently supported alarms.
Location	The location or subsystem on which the alarm was detected (if applicable).

Related Commands show alarm-log [oldest-first] on page 16-4

show alarm-log [oldest-first]

Summary Displays the contents of the Alarms log

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters *oldest-first*
The default sort order is to display the most recent alarm at the top of the command output.

Specifying the oldest-first option displays the output in reverse-chronological order, so that the oldest log entry is displayed at the top of the command output and the newest entry at the bottom.

Description This command displays the current contents of the Alarms log. Alarms are identified by timestamp, type (ALM), state (SET or CLR), severity level, a brief description, and the location on the chassis.



TIP: Remember, because the Alarms log overwrites old entries, its contents may not accurately reflect the resolution state of alarm conditions.

Example

```
BASR(config-if)# show alarm-log
2005-08-02 09:50:07, ALM, SET, MAJ, ADSL ATU-R LPR, port 1
2005-08-02 09:50:06, ALM, SET, MAJ, ADSL ATU-C LOS, port 1
2005-08-02 09:50:06, ALM, SET, MAJ, ADSL ATU-C LOF, port 1
2005-08-02 09:45:27, ALM, CLR, ADSL ATU-R LPR, port 1
2005-08-02 09:45:26, ALM, CLR, ADSL ATU-C LOS, port 1
2005-08-02 09:45:26, ALM, CLR, ADSL ATU-C LOF, port 1
2005-08-02 09:45:07, ALM, SET, MAJ, ADSL ATU-R LPR, port 1
2005-08-02 09:45:06, ALM, SET, MAJ, ADSL ATU-C LOS, port 1
2005-08-02 09:45:06, ALM, SET, MAJ, ADSL ATU-C LOF, port 1
```

Command Output A display of alarm messages currently in the Alarms log.

Hexadecimal timestamp	The hexadecimal representation of the timestamp associated with the message. This timestamp reflects the time at which the alarm occurred (based upon the system clock setting), not the time at which the alarm was displayed. Hexadecimal timestamps can be converted to readable timestamps using the “show log timestamp” command.
Type	This always indicates ALM (Alarm).
State	This indicates SET or CLR, depending on the alarm message content.
Severity	Minor (MIN), Major (MAJ), or Critical (CRI).
Description	A brief textual description of the alarm. Refer to “BAS Alarms” on page 16-10 for information on currently supported alarms.
Location	The location or subsystem on which the alarm was detected (if applicable).

Related Commands show alarms on page 16-4

show event-log [oldest-first]

Summary Displays the contents of the Events log.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters *!oldest-first!*

The default sort order is to display the most recent event at the top of the command output.

16.4

Alarms and Events Show Commands

Specifying the oldest-first option displays the output in reverse-chronological order, so that the oldest log entry is displayed at the top of the command output and the newest entry at the bottom.

16.5

Alarm Lead Configuration Commands

Description This command displays the current contents of the Events log. Events are identified by hexadecimal timestamp, type (EVT), a brief description, and the location on the chassis.

Example

```
10.11.2.5# show event-log
2005-08-09 15:36:36, EVT Network Loop Detected-MAC 0x000a9f5007e2 on multiple ports
2005-08-09 13:49:56, EVT Network Loop Detected-MAC 0x000a9f5007e2 on multiple ports
```

Command Output A display of event messages currently in the Events log.

Timestamp	The timestamp associated with the message in YYYY-MM-DD HH:MM:SS format. This timestamp reflects the time at which the event occurred (based upon the system clock setting), not the time at which the event was displayed.
Type	This always indicates EVT (Event).
Description	A brief textual description of the event (for example, TCA ADSL ATU-C LOFs describes a Threshold Crossing Alarm of Loss of Framing seconds detected by the ATU-C). Refer to "BAS Events" on page 16-11 for information on currently supported events.
Location	The location or subsystem on which the event was detected (if applicable).

Related Commands

- adslalarmconfprofiletable adslatucthresh15miness {<seconds>} on page 6-17
- adslalarmconfprofiletable adslatucthresh15minlofs {<seconds>} on page 6-18
- adslalarmconfprofiletable adslatucthresh15minlols {<seconds>} on page 6-18
- adslalarmconfprofiletable adslatucthresh15minloss {<seconds>} on page 6-19
- adslalarmconfprofiletable adslatucthresh15minlprs {<seconds>} on page 6-20
- adslalarmconfprofiletable adslatucthreshfastratedown {<bps change>} on page 6-20
- adslalarmconfprofiletable adslatucthreshfastrateup {<bps change>} on page 6-21
- adslalarmconfprofiletable adslatucthreshinterleaveratedown {<bps change>} on page 6-21
- adslalarmconfprofiletable adslatucthreshinterleaverateup {<bps change>} on page 6-22
- adslalarmconfprofiletable adslaturthesh15miness {<seconds>} on page 6-23
- adslalarmconfprofiletable adslaturthesh15minlofs {<seconds>} on page 6-23
- adslalarmconfprofiletable adslaturthesh15minloss {<seconds>} on page 6-24
- adslalarmconfprofiletable adslaturthesh15minlprs {<seconds>} on page 6-24
- adslalarmconfprofiletable adslaturtheshfastratedown {<bps change>} on page 6-25
- adslalarmconfprofiletable adslaturtheshfastrateup {<bps change>} on page 6-26
- adslalarmconfprofiletable adslaturtheshinterleaveratedown {<bps change>} on page 6-26
- adslalarmconfprofiletable adslaturtheshinterleaverateup {<bps change>} on page 6-27
- show alarms on page 16-4

16.5 Alarm Lead Configuration Commands

The following commands are used to configure the four alarm leads available on 48-port BAS devices.



NOTE: The following commands are not applicable to 16- or 32-port BAS devices.

configure contact-closure output {1 | 2 | 3 | 4} {open | close} {over-temperature | under-voltage | fuse-failure | fan-failure | gigabit-ethernet-los | adsl-los | adsl-lof | any-alarm}

Summary Configures an alarm-lead for output operation and specifies the alarm trigger.

Required Mode Global Config

User Entered Parameters {1/2/3/4}

The rear panel discrete alarm lead to configure, as labeled 'Alarm 1,' 'Alarm 2,' 'Alarm 3,' or 'Alarm 4' on the rear of the 48-port BAS.

{open / close}

Determines whether to activate the alarm based upon contact closure or contact opening. The default condition is open. Set this option as follows:

- Select **open** if the external alarm monitoring mechanism (audible alarm, visual alarm, RTU alarm monitor, and so forth) requires contact closure to trigger the alarm.
- Select **closed** if the external alarm monitoring mechanism (audible alarm, visual alarm, RTU alarm monitor, and so forth) requires an open contact to trigger the alarm.

{over-temperature / under-voltage / fuse-failure / fan-failure / gigabit-ethernet-los / adsl-los / adsl-lof / any-alarm}

The specific condition for triggering the alarm. Trigger conditions are defined as follows:

- over-temperature – The internal temperature of the BAS reaches a threshold (80° C) that significantly exceeds normal operating temperatures; the alarm clears when the internal temperature drops to 60° C.
- under-voltage – The voltage detected by the BAS drops below the expected threshold. THRESHOLD INFO TBD. The alarm is cleared when voltage returns within the normal operating threshold.
- fuse-failure – A replaceable fuse blows due to an over-current condition. The alarm is cleared at fuse replacement.
- fan-failure – A fan fails (loss of blade rotation). The alarm is cleared when rotation is restored.
- gigabit-ethernet-los – A gigabit Ethernet port experiences a Loss of Signal condition. The alarm is cleared when signal is restored.
- adsl-los – An ADSL port experiences a Loss of Signal defect. A Loss of Signal defect indicates the received ADSL signal power is below a threshold determined immediately after successful initialization. Loss of Signal is cleared when signal power returns to at or above the threshold value.
- adsl-lof – An ADSL port experiences a Loss of Framing condition. Loss of Frame (LOF) is declared after 2.5 +/- 0.5 seconds of contiguous severely errored frame defects. LOS overrides it. Once a LOF condition has been declared, it is cleared by 10 +/- 0.5 contiguous seconds with no Severely Errored Frame (SEF) defects.
- any-alarm – An alarm of *any* type is detected by the BAS and cleared when the corresponding clearing condition is met. See "BAS Alarms" on page 16-10 for a full list of alarms.

16.5

Alarm Lead Configuration Commands

16.5

Alarm Lead Configuration Commands



NOTE: ADSL alarms can occur with some frequency. ADSL alarms are NOT based upon the ADSL trap threshold settings. ADSL traps are reported as BAS events, which do not drive the contact alarms.

Description This command configures the specified discrete alarm lead for output operation so that the BAS generates a discrete alarm when it detects some internal failure condition. To use this feature, the BAS must be connected to an external alarm monitoring mechanism, and the alarm relay must be appropriately set for contact opening or closure as appropriate for that mechanism.

“no” form no configure contact-closure output {1 | 2 | 3 | 4} {open | close} {over-temperature | under-voltage | fuse-failure | fan-failure | gigabit-ethernet-los | adsl-los | adsl-lof | any-alarm}
The “no” form of the command removes a previously-specified trigger condition from the designated alarm lead.

Defaults Not configured.

Example

```
BASR# configure contact-closure output 1 open over-temperature
```

Related Commands configure contact-closure input {1 | 2 | 3 | 4} {open | close} [<alarm description>] on page 16-8
show contact-closure on page 16-9

```
configure contact-closure input {1 | 2 | 3 | 4} {open | close} [<alarm description>]
```

Summary Configures an alarm-lead for input operation.

Required Mode Global Config

User Entered Parameters

{1/2/3/4}

The rear panel discrete alarm lead to configure, as labeled ‘Alarm 1,’ ‘Alarm 2,’ ‘Alarm 3,’ or ‘Alarm 4’ on the rear of the 48-port BAS.

{open / close}

Determines whether to activate the alarm based upon whether the external alarm generating mechanism is based upon contact closure or contact opening. The default condition is open. Set this option as follows:

- Select **open** is the external alarm mechanism is configured as a normally closed input (such as a pin switch in a door for example). The BAS raises the alarm when the customer-supplied external mechanism goes from a closed circuit state to an open circuit state.
- Select **closed** when the external alarm mechanism is configured as a normally open input. The BAS raises when the customer-supplied external device goes from an open circuit state to a closed circuit state.

<alarm description>

You can enter an optional alarm description of up to 80 characters to indicate the alarm trigger. Note that you must enclose the description in quotation marks if there are spaces in the description (for example, “door open alarm”).

16.5

Alarm Lead
Configuration
Commands

Description This command configures the specified discrete alarm lead for input operation so that the BAS issues a discrete alarm when it senses a state change in some external, user-defined alarm generating mechanism based upon an open- or closed-circuit state. The BAS must be connected to an external alarm generating mechanism for this feature to operate.

If the BAS issues a discrete alarm based upon an input condition, a generic “input alarm detected” message is reported to the BAS alarm log and forwarded to the BAM network management server (if present on the network). If the optional description is provided, that is included in the message reported to the BAS alarm log; however, the description is not currently forwarded in the message sent to the BAM NMS.

“no” form no configure contact-closure input {1 | 2 | 3 | 4}
The “no” form of the command removes a previously-specified input condition from the alarm lead.

Defaults Not configured.

Example

```
BASR# configure contact-closure input 2 "door open"
```

Related Commands configure contact-closure output {1 | 2 | 3 | 4} {open | close} {over-temperature | under-voltage | fuse-failure | fan-failure | gigabit-ethernet-los | adsl-los | adsl-lof | any-alarm} on page 16-7
show contact-closure on page 16-9

```
show contact-closure
```

Summary Displays alarm-lead settings.

Required Mode Privileged Exec, Global Config, Interface Config, or Line Config

User Entered Parameters None

Description This command displays the current configuration of the BAS alarm-leads.

Example

```
BASR# show contact-closure
```

Contact Closure Configuration

CAC	Configured	Normally	Direction	Alarms
1	Yes	Opened	Output	Gig-E LOS
2	No	Opened	Output	
3	Yes	Closed	Input	Over-Temp
4	No	Opened	Output	

16.6

Alarm and Event
Reference

Command Output This command displays the following alarm-lead configuration information.

CAC	The index of the rear-panel alarm-lead.
Configured	Indicates whether the alarm-lead is configured to issue a discrete alarm (Yes) or not (No).
Normally	Indicates whether the alarm trigger expects a contact closure event (Normally Opened) or a contact open event (Normally Closed).
Direction	Indicates whether the alarm-lead is configured for Output operation (detecting internal BAS alarms) or Input operation (sensing external state changes).
Alarms	The associated alarm trigger: over-temperature, under-voltage, use-failure, fan-failure, gigabit-ethernet-los, adsl-los, adsl-lof, or any-alarm.

Related Commands configure contact-closure output {1 | 2 | 3 | 4} {open | close} {over-temperature | under-voltage | fuse-failure | fan-failure | gigabit-ethernet-los | adsl-los | adsl-lof | any-alarm} on page 16-7
configure contact-closure input {1 | 2 | 3 | 4} {open | close} [<alarm description>] on page 16-8

16.6 Alarm and Event Reference

The following alarms and events are currently supported for BAS logging.

BAS Alarms

The following alarms are supported by the BAS:

ADSL ATU-C LOF port N

An ATU-C (near-end) Loss of Framing alarm has been detected at the designated port.

ADSL ATU-C LOS port N

An ATU-C (near-end) Loss of Signal alarm has been detected at the designated port.

ADSL ATU-C LPR port N

An ATU-C (near-end) Loss of Power alarm has been detected at the designated port.

ADSL ATU-C LOSQ port N

An ATU-C (near-end) Loss of Signal Quality alarm has been detected at the designated port. Loss of Signal Quality is declared when the Noise Margin falls below the Minimum Noise Margin, or the bit-error-rate exceeds 10^{-7} .

ADSL ATU-C LOL port N

An ATU-C (near-end) Loss of Link alarm has been detected at the designated port.

ADSL ATU-C Data Init Failure port N

An ATU-C (near-end) failure during line initialization at the designated port, due to bit errors corrupting start-up exchange data.

ADSL ATU-C Config Init Failure port N

An ATU-C (near-end) failure during line initialization at the designated port, due to its not supporting the line configuration requested by the peer ATU (CPE).

ADSL ATU-C Protocol Init Failure port N

An ATU-C (near-end) failure during line initialization at the designated port, due to an incompatible protocol used by the peer ATU (CPE).

ADSL ATU-C No Peer Atu Present port N

The ATU-C has detected that there is no CPE (peer ATU) at the other end of the connection.

ADSL ATU-R LOS port N

An ATU-R (remote-end) Loss of Signal alarm has been detected at the designated port.

ADSL ATU-R LOF port N

An ATU-R (remote-end) Loss of Framing alarm has been detected at the designated port.

ADSL ATU-R LPR port N

An ATU-R (remote-end) Loss of Power alarm has been detected at the designated port.

ADSL ATU-R LOSQ port N

An ATU-R (remote-end) Loss of Signal Quality alarm has been detected at the designated port. Loss of Signal Quality is declared when the Noise Margin falls below the Minimum Noise Margin, or the bit-error-rate exceeds 10^{-7} .

Overtemp

An over temperature condition has been detected by the on board environmental sensors.

Fan Failure Fan N

A fan failure has been detected at the designated fan module.

Gigabit LOS port N

A Loss of Signal alarm has been detected on the designated gigabit Ethernet port.

Voltage low port N

A low voltage condition has been detected at the designated power feed.

Fuse blown port N

A blown fuse has been detected at the fuse block associated with the designated power feed.

EAPS Ring Failure

The EAPS Master node has detected a ring-down condition on the EAPS ring.

BAS Events

The following event conditions are supported on the BAS, where port N is the port on which the event occurred, count C is the count that triggered the event, and threshold T is the threshold setting:

TCA ADSL ATU-C LOFs, port N count C threshold T

The threshold for ATU-C Loss of Framing seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslatucthresh15minlofs {<seconds>}” on page 6-18.

TCA ADSL ATU-C LOSs, port N count C threshold T

The threshold for ATU-C Loss of Signal seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslatucthresh15minloss {<seconds>}” on page 6-19.

16.6

Alarm and Event
Reference**TCA ADSL ATU-C LOLs, port N count C threshold T**

The threshold for ATU-C Loss of Link seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslatucthresh15minlols {<seconds>}” on page 6-18.

TCA ADSL ATU-C LPRs, port N count C threshold T

The threshold for ATU-C Loss of Power seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslatucthresh15minlprs {<seconds>}” on page 6-20.

TCA ADSL ATU-C ESs, port N count C threshold T

The threshold for ATU-C Errored Seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslatucthresh15miness {<seconds>}” on page 6-17.

TCA ADSL ATU-R LOFs, port N count C threshold T

The threshold for ATU-R Loss of Framing seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslaturthresh15minlofs {<seconds>}” on page 6-23.

TCA ADSL ATU-R LOSSs, port N count C threshold T

The threshold for ATU-R Loss of Signal seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslaturthresh15minloss {<seconds>}” on page 6-24.

TCA ADSL ATU-R LPRs, port N count C threshold T

The threshold for ATU-R Loss of Power seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslaturthresh15minlprs {<seconds>}” on page 6-24.

TCA ADSL ATU-R ESs, port N count C threshold T

The threshold for ATU-R Errored Seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslaturthresh15miness {<seconds>}” on page 6-23.

TCA ADSL ATU-C Failed Fast Retrains, port N count C threshold T

The threshold set for the “failed fast retrain” trap for the interface has been crossed. See “adslalarmconfprofiletable adslatucthreshold15minfailedfast {<count>}” on page 6-5.

TCA ADSL ATU-C SES, port N count C threshold T

The threshold for ATU-C Severely Errored Seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslatucthreshold15minsese {<seconds>}” on page 6-6.

TCA ADSL ATU-C UAS, port N count C threshold T

The threshold for ATU-C Unavailable Seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslatucthreshold15minuas {<seconds>}” on page 6-7.

TCA ADSL ATU-R SES, port N count C threshold T

The threshold for ATU-R Severely Errored Seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofiletable adslaturthreshold15minsese {<seconds>}” on page 6-6.

TCA ADSL ATU-R UAS, port N count C threshold T

The threshold for ATU-R Unavailable Seconds (in the current 15 minute interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold15minuasl {<seconds>}” on page 6-7.

TCA ADSL ATU-C FECS, port N count C threshold T

The threshold for ATU-C Forward Error Connection anomalies (in the current 15 minute interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold15minfecsl {<count>}” on page 6-6.

TCA ADSL ATU-R FECS, port N count C threshold T

The threshold for ATU-R Forward Error Connection anomalies (in the current 15 minute interval) has been passed. See “adslalarmconfprofilextable adslaturthreshold15minfecsl {<count>}” on page 6-6.

TCA ADSL ATU-C LOFs (day), port N count C threshold T

The threshold for ATU-C Loss of Framing seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold1daylofs {<seconds>}” on page 6-9.

TCA ADSL ATU-C LOSs (day), port N count C threshold T

The threshold for ATU-C Loss of Signal seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold1dayloss {<seconds>}” on page 6-10.

TCA ADSL ATU-C LOLs (day), port N count C threshold T

The threshold for ATU-C Loss of Link seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold1daylols {<seconds>}” on page 6-9.

TCA ADSL ATU-C LPRs (day), port N count C threshold T

The threshold for ATU-C Loss of Power seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold1daylprs {<seconds>}” on page 6-11.

TCA ADSL ATU-C ESs (day), port N count C threshold T

The threshold for ATU-C Errored Seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold1dayess {<seconds>}” on page 6-8.

TCA ADSL ATU-C SES (day), port N count C threshold T

The threshold for ATU-C Severely Errored Seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold15minsesl {<seconds>}” on page 6-6.

TCA ADSL ATU-C UAS (day), port N count C threshold T

The threshold for ATU-C Unavailable Seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslatucthreshold1dayuasl {<seconds>}” on page 6-7.

TCA ADSL ATU-R LOFs (day), port N count C threshold T

The threshold for ATU-R Loss of Framing seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofilextable adslaturthreshold1daylofs {<seconds>}” on page 6-9.

16.6

Alarm and Event
Reference**TCA ADSL ATU-R LOSSs (day), port N count C threshold T**

The threshold for ATU-R Loss of Signal seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofileexttable adslaturthreshold1dayloss {<seconds>}” on page 6-10.

TCA ADSL ATU-R LPRs (day), port N count C threshold T

The threshold for ATU-R Loss of Power seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofileexttable adslaturthreshold1daylprs {<seconds>}” on page 6-11.

TCA ADSL ATU-R ES (day), port N count C threshold T

The threshold for ATU-R Errored Seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofileexttable adslaturthreshold1dayess {<seconds>}” on page 6-8.

TCA ADSL ATU-R SES (day), port N count C threshold T

The threshold for ATU-R Severely Errored Seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofileexttable adslaturthreshold15minsesl {<seconds>}” on page 6-6.

TCA ADSL ATU-R UAS (day), port N count C threshold T

The threshold for ATU-R Unavailable Seconds (in the current 24 hour interval) has been passed. See “adslalarmconfprofileexttable adslaturthreshold15minsesl {<seconds>}” on page 6-6.

TCA ADSL ATU-C FECS (day), port N count C threshold T

The threshold for ATU-C Forward Error Connection anomalies (in the current 24 hour interval) has been passed. See “adslalarmconfprofileexttable adslatucthreshold1dayfecsl {<count>}” on page 6-6.

TCA ADSL ATU-R FECS (day), port N count C threshold T

The threshold for ATU-R Forward Error Connection anomalies (in the current 24 hour interval) has been passed. See “adslalarmconfprofileexttable adslaturthreshold1dayfecsl {<count>}” on page 6-6.

Network Loop Detected – MAC 0x:XX:XX:XX:NN:NN:NN on multiple ports

A network loop has been detected, since the specified source MAC address has been detected by multiple switch ports. Check the network topology.

Duplicate EAPS Master detected

If the BAS is acting as the EAPS Master node, it sends this message if it detects a health check packet from a different source MAC address than its own. The BAS continues to issue this message periodically until it stops seeing health check packets from the other source.



Appendix A

List of Commands

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Appendix B

Example Running Config

The following shows the example output from a “show running config” command, performed after the initial configuration of IP and SIP network parameters, and start-up of ADSL ports in their default state. Comments are appended to indicate the result of each command.

```
#
# Pannaway Technologies
#
ip address data 10.10.1.9 255.255.255.0
# Assigns the IP address/subnet mask to a Gigabit Ethernet interface

ip name-server 172.168.11.33
# Assigns the primary DNS IP address

ip name-server 172.168.15.25
# Assigns the secondary DNS IP address

ntp server time.nist.gov
# Assigns the Network Time Protocol (NTP) server

ip default-gateway 10.10.1.1
# Assigns the default gateway for the Gigabit Ethernet interface

dialplan northamerica
# Enforces North American dial plan

sip proxy host 10.10.1.11
# Specifies the SIP Proxy server (e.g., CCM)

sip registration host 10.10.1.11
# Specifies the SIP Registrar server (e.g., CCM)

sip enable
# Activates the SIP protocol on the box

voice ip address 10.10.2.7
# Assigns an IP address to the voice functionality/DSP

voice dial-peer lifeline 1 5556543
# Provide lifeline service to ADSL line 1 (duplicating PBG-ADSL CPE's POTS
port 1 phone number)
```

```
voice dial-peer pots 2 5557298
# Assign SIP phone number to port 2; use for POTS service only

voice dial-peer lifeline 3 5551637
# Provide lifeline service to ADSL port 3 (PBG-ADSL POTS port 1 number)

voice dial-peer lifeline 4 5554726
# Provide lifeline service to ADSL port 4 (PBG-ADSL POTS port 1 number)

remotecon timeout 30
# set timeout for remote (Telnet) sessions to BAS
#
interface adsl 1
    start
    exit
interface adsl 2
    start
    exit
interface adsl 3
    start
    exit
-----
example cut for interfaces 4-29
-----
interface adsl 30
    start
    exit
interface adsl 31
    start
    exit
interface adsl 32
    start
    exit

# starts up service on all ADSL interfaces. Because no speed is indicated,
# the default start-up mode (high-speed) is used for each interface
```

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